

by the same author

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Crown of Tragedy. Nicholas II. Kimber. (1960)

The Strategic Air Offensive Against Germany. (Jointly with Sir Charles Webster) H.M. Stationery Office. (1961)

THE BOMBING OFFENSIVE AGAINST GERMANY

OUTLINES AND PERSPECTIVES

Noble Frankland

With a Foreword by
Sir James Butler

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FOREWORD

by Sir James Butler

The four volumes by Sir Charles Webster and Dr. Noble Frankland, in the United Kingdom History of the Second World War, on the Strategic Air Offensive showed how fruitful could be the collaboration of a veteran historian with a young bomber navigator contributing the experience of more than thirty wartime raids over Germany. But Dr. Frankland, now Director of the Imperial War Museum, is a historian in his own right. In the present work, somewhat expanded from his Lees Knowles lectures of 1963, he looks back on the five years' campaign in the air and considers its place in military history. He claims that the Strategic Air Offensive of 1940-45 was the logical successor of the old-time naval blockade. If Great Britain was to apply direct, decisive pressure on the enemy and avoid the intolerable drain on her manpower of a war like that of 1914-18, strategic bombing was her natural weapon. Tracing the vicissitudes of Bomber Command in the second war Dr. Frankland shows how, whatever policy was intended, execution had to conform to what was operationally possible—an axiom of which the relevance was not always recognized—and how the operationally possible depended on advances in tactics and

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technology. The main strategic lesson that he draws from the early failures and final triumph of the bombing offensive is that Mahan's doctrine holds good with respect to air as to naval warfare: that the one thing needful is to secure 'command of the air', such as the Allies secured in March 1944 but not until then.

I feel it a great honour to be invited to write a foreword to so stimulating a book.

J.R.M.B.

PREFACE

In response to an invitation from the Council of Trinity College, Cambridge, to which I am much indebted for the honour, I delivered the Lees Knowles Lectures in November 1963. This book is based upon what I said in three lectures though I have added some further explanation, especially in Chapter II.

The sources upon which I have drawn are all published, the majority of them in *The Strategic Air Offensive Against Germany*, of which, jointly with the late Sir Charles Webster, I was the author. Naturally, where I have drawn upon other authors, I have cited the source but, in the case of the official history, I have felt it necessary to do so only when direct quotation of the words used by the subjects of that history is involved.

I greatly appreciate the generosity of Sir James Butler in writing a Foreword and I am particularly glad of the opportunity to acknowledge my great indebtedness to him for the tolerance he has shown and the encouragement he has given me over what is now a considerable period of time. I must also thank Mr. L. A. Jacketts who kindly read and commented upon the manuscript. The responsibility for the book which now appears is, of course, mine alone.

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INTRODUCTION

The strategic air offensive against Germany was one of the great campaigns in history. It was great in the sense of the issues involved for, during much of the war, it was the principal and, at times, the only means by which direct offensive pressure could be exerted against Germany. In addition, it had a major influence upon many other campaigns waged on land and at sea. It was great in the sense of the effort, sacrifice, inventive genius and production skill devoted to it. The aircrews of Bomber Command and of the United States Eighth and Fifteenth Air Forces, which later joined the offensive, were all volunteers whose fighting spirit deserves comparison with the magnificent volunteer armies which Britain sent to France in the first half of the First World War. The offensive stimulated the design and production of aircraft, weapons and equipment which even today in an age of such rapid technological advance must be regarded as astonishing. It was great too in the sense of the results achieved, for the strategic air offensive was a decisive factor in the defeat of Germany.

The offensive was also singular. It began in essence in May 1940 and was continued until April 1945. Night after

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night throughout that long period virtually the entire front line strength of Bomber Command was committed to battle and from 1943 onwards the same thing occurred by day in the American forces. In the relationship between offensive intensity and duration, the strategic air offensive against Germany is without equal in history. It was singular too in the sense that the campaign was the first and, in all probability, the last of its kind. There was a prelude in the First World War but, though a major offensive would have begun in 1919, that is more than was begun between 1914 and 1918. The introduction of nuclear weapons and guided missiles has since rendered a repetition of a long drawn-out campaign of attritional strategic bombing in a major war inconceivable.

The strategic air offensive is singular in another way as well. This is in the extent to which it has become the subject of controversy and in the nature of that controversy. Admittedly, most battles and campaigns are controversial. After they have been won or lost there nearly always seem to be ways in which victory might have been better won or defeat avoided. In recent times, one need only glance at the literature concerning the Battle of Jutland, the Battle of Passchendaele, the Battle of Britain and the Battle of Alamein to see that military decisions and methods are always open, or are always thought to be open, to criticism and to retrospective improvement. The strategic air offensive is no exception to that general rule but in its case the controversy surrounding it goes deeper. It concerns such fundamental issues as whether it was militarily useful at all and whether, even if it was, it was morally permissible. On a somewhat lower but nevertheless funda-

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mental level it concerns the related questions of what objects should have been sought and what targets were appropriate to the aim.

Such questions, involving as they do the first principles of bombing, still inspire, some twenty years after the end of the strategic air offensive, anxious thought and they still produce vigorously conflicting answers. They are even reflected, from time to time, in excited outbursts of popular journalism and, on that evidence, would seem therefore to be of concern not only to professionals and narrow specialists but also to people at large.

That this should be so, must be due in large measure to the nature of the strategic air offensive itself and the extent to which it differed from other kinds of warfare to which, over the centuries, people in general have grown more accustomed and of which 'experts', in particular, have more understanding. Air warfare after all has yet to produce the conclusive analysis and inspired insight by which, for example, Clausewitz illuminated the principles of military, and Mahan those of naval, action. In that respect, air power remains, and will probably long remain, far behind military and naval power. Moreover, the calm appraisal of it has been vastly complicated by the arrival of the nuclear weapon, a product of the idea of strategic bombing, with its already frightening past and its yet unknown future.

These considerations, perhaps, indicate why what is popularly known as the 'bomber controversy' is so persistent and why, to such an extent, it transcends the normal frontiers of military argument. They may indicate too why the strategic air offensive is important and interesting be-

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yond the extent of the actual part which it played in the Second World War.

Strategic bombing, after all, is the heart of air power. It is strategic bombing which distinguishes air power from military and naval power by giving it a characteristic beyond what it would otherwise have been, a mere adjunct of armies and of navies. It was the idea of strategic bombing which resulted, first in Britain and then elsewhere, in the creation of air forces as separate fighting services. And, of course, the strategic air offensive against Germany in the Second World War is the greatest source of vocabulary from which on the basis of observed usage the grammar of air power may eventually be compiled.

Progress to date seems to be disappointing. The controversy appears to be approximately at the stage at which it began and the controversy was not created in the Second World War; it was created by the invention of the idea of strategic bombing itself. To recall the views which were expressed in 1917 by Smuts, Haig and Churchill serves as a reminder of this.

Smuts was an advocate of strategic bombing even before much possibility of carrying it out existed. He believed that the direct bombing of populous cities would become a principal means of waging and winning wars. He even thought that this might render military and naval activities 'secondary and subordinate'.¹ Haig, on the other hand, was doubtful 'from the point of view of morality and public opinion, of seeking to end the war by "devastation of enemy lands and destruction of industrial and populous

¹ The relevant passage is quoted below, p. 34.

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centres on a vast scale . . .", and he did not believe that military and naval warfare was, in any case, likely to be rendered 'secondary and subordinate'.¹ Churchill's comments, written when he was Minister of Munitions in October 1917, introduced other debatable points.

'It is improbable,' he wrote, 'that any terrorization of the civil population which could be achieved by air attack would compel the Government of a great nation to surrender. Familiarity with bombardment, a good system of dug-outs or shelters, a strong control by police and military authorities, should be sufficient to preserve the national fighting power unimpaired. In our own case we have seen the combative spirit of the people roused, and not quelled, by the German air raids. Nothing that we have learned of the capacity of the German population to endure suffering justifies us in assuming that they could be cowed into submission by such methods, or, indeed, that they would not be rendered more desperately resolved by them. Therefore our air offensive should consistently be directed at striking at the bases and communications upon whose structure the fighting power of his armies and his fleets of the sea and of the air depends. Any injury which comes to the civil population from this process of attack must be regarded as incidental and inevitable.'²

Thus, at the outset, the questions of the morality, purpose and relationship to what has since been called grand

¹ H. A. Jones, *The War in the Air*, Appendices, p. 15, Oxford, Clarendon Press (1937).

² Ibid. p. 19.

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strategy as well as the question of target selection itself were all raised and differently answered. Implicit in these questions was another which referred to the efficiency of strategic bombing. These are the very questions which are still being asked and differently answered.

When Smuts, Haig and Churchill were attempting to solve these problems, the last with remarkable prescience, there was little real evidence in front of them. Strategic bombing was in a virtually prenatal condition and it remained so until 1940. It is therefore not surprising that there were wide differences of expectation. While the offensive was being conducted, the 'other side of the hill' was largely invisible and there was also, of course, a constant pressure upon practically all the elements of the fighting forces which naturally led each of them to feel that it was being accorded an inadequate priority in the grand strategy of the war. It is therefore not surprising that there continued to be wide differences of opinion about how these questions should be answered. But that these differences should still be as wide twenty years later is surprising.

Perhaps the reason is that people have preferred to feel rather than to know about strategic bombing. Certainly much that is written about it seems to be inspired, on one hand, by the high motive of loyalty and, on the other, by conscientious anxieties about the future. Excellent as the motives may be in both cases, neither approach is likely to shed much light upon the subject which is pivotal to the whole discussion, namely, the strategic air offensive against Germany. Thus, the curious position tends to arise in which the various judgements of strategic bomb-

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ing which are made, are scarcely related to the knowledge of the campaign which exists.

The chapters which follow are written on the assumption that there is a need to relate views of bombing to the circumstances, decisions and events which governed its conduct in the war against Germany. In the first, entitled 'In Prospect', the origins of the idea and its development up to the outbreak of the Second World War are examined. Herein at any rate lay some of the circumstances which governed the conduct of the campaign, for modern *matériel* is usually too complex to be modified or replaced more than slowly and *matériel* often dictates tactics which often, in turn, dictate strategy. In the second chapter, entitled 'In Action', an attempt is made to reveal the main characteristics of the campaign in the event and to show the stages and methods by which it developed. The last chapter, 'In Retrospect', seeks to relate the questions which are now asked about bombing to the references which it is hoped have been established in the other parts of the book.

I. IN PROSPECT

The idea of strategic bombing has deep historical roots—deeper than is often supposed. The myth which suggests that strategic bombing was the product of a sudden impulse or aberration which was thrust upon the scene against the natural course of history in general and of strategic thought in particular, and that it owed its growth and survival to the power of personality, dedication and obstinacy of a single great, but, perhaps, wrong-headed man, Lord Trenchard, contains a germ of truth but a larger one of untruth.

The idea of strategic bombing had a close historical parallel with the ancient weapon of naval blockade. The course of naval history, and especially that part of it from, say, 1859, when H.M.S. *Warrior*, the first of the ironclads, was begun, until 1916, when the dreadnoughts met in action at the Battle of Jutland, had more relevance to the idea of strategic bombing than any doctrinaire theories put independently into men's minds by the conquest of the air and the subsequent exploitation of it in the same period.

Naval blockade had the characteristic of bringing direct pressure to bear upon the heart of the enemy and it had

the advantage of being effective without regard to the superiority of the military strength against which it might be pitted. When ships were wooden, it also had the advantage of being cheap or at any rate much cheaper than the raising and maintaining of massive armies on the continental scale. It had too the special advantage for Britain of being no more than a by-product of something which was in any case indispensable to her if she was to survive at all, namely the command of the sea. A few ships of the line were a better proposition for Britain than six hundred thousand soldiers were for Napoleon and a far better one than six hundred thousand soldiers would have been for Britain.

But in the course of time the terms of war began to turn more and more against this naval strategy. It was not simply that the sea power of Britain in relation to that of the rest of the world declined. It was also that sea power itself declined in efficacy and the principal among many causes of this was that the individual units of it became too formidable and too expensive to be expendable. This fact was registered in the Dardanelles and at the Battle of Jutland. The truism that Jellicoe was the one man who could have lost the First World War in a matter of hours arose from the basic reason that he had too much power concentrated in too few units.

The very reasons which had previously produced from Britain's sea power her best offensive weapon, now forced her to use her sea power for predominantly defensive purposes and that, broadly speaking, is what she had to do throughout the Second World War. It may be observed, of course, to take one example, that the Battle of the Atlantic

had offensive purposes and this is true in the sense that neither the allied invasion of Normandy nor the strategic air offensive against Germany could have taken place if the Battle of the Atlantic had not been won. The point, however, which deserves emphasis is that sea power was being used, as it always had been, to protect lines of communication. It was not being used, as it previously had also been, to exert in itself direct and decisive pressure against the heart of the enemy.

For this purpose, something else had to be found and it seems to be more than a coincidence that the most damaging war in history from the British point of view occurred while the search was on, that is in the interval between the decline of sea power and the rise of air power, that is in the Flanders mud of 1914-18. This fearful struggle was the second great factor in creating the climate for strategic bombing. The need to find a substitute for the offensive purpose of sea power was mirrored and emphasized by the need not to accept trench warfare as that substitute.

This conclusion has been obscured to a great extent by the historians of the First World War. The earlier works (including, to an alarming extent, the official histories), reflected the war-time communiqués in suggesting that there was nothing special about the war except that it was on a bigger scale than previous ones. But even before many of these histories had been published, the theory had disintegrated. In the 1920s the men who had been in the trenches began to reveal to the ignorant public what had happened there. Edmund Blunden's *Undertones of War* was first published in 1928, Robert Graves' *Goodbye to All*

That and a yet more famous book, *All Quiet on the Western Front*, appeared in 1929. The cat leapt out of the bag and the history which was being so meticulously compiled was rendered obsolete and irrelevant before it appeared. But appear it duly did, with the result that a new generation of historians was given a double incentive to rewrite it.

Many of them still seem to miss the point and we are being offered as a substitute for an over-simplification another over-simplification, the over-simplification contained in the title of Mr. Alan Clark's book, *The Donkeys*.

To explain the disaster of 1914-18 simply in terms of the ineptitude of the High Command in general and of Haig in particular is as absurd as to claim that it did not occur. The operative explanation is to be sought in what have aptly been described as 'the unique physical conditions of that terrible war. . . .'¹ How else could the same thing have happened to every country and to every army? The same operative explanation is also the key to the incentive which produced out of the history of naval blockade the idea of strategic bombing.

Even so, the 'Donkey' school of thought not only invites us to believe that the leaders in the First World War were fools. It also tries to convince us that they cared little for the consequences of their follies, and that sitting in their comfortable back areas in their polished boots and well-cut uniforms they had no feeling for the men in front of them who either endured with the rats in the mud or perished on the firmer ground over the top. But this

¹ John Terraine: *The Royal United Service Institution Journal*, May 1962, p. 144.

charge of brutal inhumanity proceeds more from shock than from reason; and amongst the things which it reckons without is the evolution of the idea of strategic bombing. Among the back-area men were Smuts, Sykes, Brancker and Trenchard, and they at least were on the lookout for a way over the trenches. Their disciples, the future leaders of the Royal Air Force, came from those who already had the experience of looking down on the trenches: Portal, Harris, Tedder, Slessor among them.

The idea of strategic bombing then had its roots in history, in naval history. It derived its urgency from the military deadlock in the trenches and, it may well be argued, its moral justification from the horrors which occurred there.

Basically this idea concerned the destruction of the sources as opposed to the manifestations of an enemy's war power and it is not surprising to note that the first essays in strategic bombing on the British side were framed by the Royal Navy. They consisted of attempts to destroy such targets as the Zeppelin sheds at Friedrichshafen. Zeppelins, in addition to being a threat to British towns, were being used as the eyes of the German fleet. The prospects of engaging and destroying them in the air were problematical. A possible way of dealing with them seemed to be to kill them in their nests—to use a phrase of Sir Winston Churchill's when a corresponding threat from the Focke-Wulf Condors had to be met in the Second World War. Perhaps too they might be killed not only in their nests but even while they were in gestation. Hence the bombing attacks on their hangars and assembly

sheds. These attacks came to little and were soon abandoned. There was more urgent work to be done in direct support of the army in the trenches. Nevertheless, the idea, if only just, remained alive. It was the germ of a doctrine which in the next twenty-five years developed into the strategic air offensive of the Second World War.

It is strange that those who developed this doctrine and tried later to put it into practice are now in danger of being labelled as the 'donkeys' and the exponents of inhumanity of the second war. It is strange because they were surely driven to their work by the need to find a strategic alternative to a second trench war which would offer a means of victory which might leave the victor distinguishable from the vanquished. Nevertheless, and even in its origins, the idea of strategic bombing was riddled with curious contradictions and *non sequiturs* which greatly influenced the conditions in which Bomber Command eventually operated during the Second World War.

Three of these had particularly far-reaching consequences. First, though strategic bombing was in essence naval blockade writ new, the doctrinaire principles which were evolved to support it departed radically from the principles of sea power with their foundations in experience and observed results. Secondly, the Royal Air Force, which was the essential structure for the growth of the idea of strategic bombing, was formed from an amalgamation of a part of the army, the Royal Flying Corps, and a part of the navy, the Royal Naval Air Service. All its original officers were soldiers or sailors. In fact, the first Chief of the Air Staff who started his service in the Royal

Air Force was Sir Dermot Boyle.¹ Yet the new service developed little understanding of the older ones and the older ones were correspondingly reluctant to afford it living space. Thirdly, the great motive force of the Royal Air Force was the offensive one enshrined in the idea of strategic bombing. Yet it was a defensive crisis which brought it into being. If this was ironic it was doubly so because it was, of course, in the defensive Battle of Britain that the Royal Air Force was eventually to encounter its most glorious and its most decisive passage of arms.

The first of these crucial defensive crises came in the spring and summer of 1917 when the Germans began a series of bombing attacks on England. Using Gotha aircraft, the Germans initially struck at small towns in the south-east but presently they extended their operations further afield and struck at London itself. The Gothas could fly at up to 80 m.p.h. and up to 15,000 feet. They had four engines and owed much of their design to the British Handley Pages.

On 13th June 1917, 21 of these Gothas crossed the south coast of England. Fourteen of them, grouped in a formation, flew on to London. They arrived over the capital just after half-past eleven in the morning. They dropped 118 high explosive bombs. Among the direct hits achieved was one on Liverpool Street Station. Some 150 people were killed and more than 350 injured. More than 90 British defending aircraft took off to engage the bombers but not one of them was shot down and all returned safely to their bases on the continent. This remark-

¹ He was Chief of the Air Staff from 1956 to 1959.

able operation marked a new point of departure in the history of air warfare.

Originally aeroplanes and to a great extent Zeppelins had been thought of simply as the eyes of armies and fleets. They derived this function from observation balloons whose military history went back to the Napoleonic wars. Indeed, as early as 1794 General Jourdan had used a balloon to survey the Austrian lines before the Battle of Fleurus. Subsequently the use of balloons was extended and they did work of growing importance in the American Civil War, in the Boer War and elsewhere.

It then became apparent that this work of observation, if it was to be extended far behind the lines, could be done much better by navigable Zeppelins proceeding under their own power and better still by aeroplanes. Clearly there were limitations upon balloons which could only either rise on the end of a cable or drift on the wind, and it was as a more versatile means of reconnaissance that Zeppelins and aeroplanes were grafted on the military organizations of the great powers. Thus, the possibility of observing not only the enemy's tactical disposition at the front but also his strategic intentions by going behind the lines was conferred. These two purposes were presently labelled in the manuals as tactical and strategic reconnaissance and the first step, if unwittingly, was therefore taken towards strategic bombing, for obviously if one could pass over the enemy lines to look down on his back areas one could also drop destruction on him there as well. Between this possibility and the Gotha raid in June 1917 there were, however, a series of important steps with their lessons observed and unobserved which need to be out-

lined so that the extraordinary consequences of the Gotha raid may be seen in perspective.

The 1914 war, as is sometimes forgotten, started as a war of sudden, rapid and extensive movement. One of the greatest problems initially facing the British and French generals concerned the discovery of where the Germans were. Aeroplanes offered the quickest if not yet the surest means of finding out, and it was for this purpose that the first Royal Flying Corps squadrons in France were used. Presently the armies stuck, the trench war began and the role of aeroplanes changed. The main hope now was that a break-through could be achieved after an artillery barrage had played havoc with the enemy positions. Aeroplanes were drawn back into the balloon function of artillery spotting or shell aiming.

In this function they soon demonstrated three abilities which were beyond the balloons. First, with relative ease, they could destroy the balloons and therefore deny the enemy that means of observation.¹ Secondly, they could destroy each other and, therefore, seek to deny the enemy any means of observation. Thirdly, they could themselves, in reinforcement of the artillery, carry shells, or bombs, and drop them directly on the enemy.

The early machines undertook all these tasks as opportunities presented themselves. Intelligence was sent from the air by wireless. It was also recorded by photography. Air fighting was carried out with duck guns, rifles, re-

¹ The task of destroying a balloon was relatively easy, not easy. See Lord Douglas of Kirtleside: *Years of Combat*, pp. 319-20, Collins (1963).

volvers and then with airborne machine-guns. Bombing was done with darts, hand grenades and then with bombs of increasing size. This led to specialization. In particular, it led to two types of specialization which gradually produced two distinctive types of aeroplane which were distinguishable as 'bombers' and 'fighters'.

The original machines, for example, the Royal Flying Corps BE2cs, were general purpose aeroplanes in the sense that they were no more than flying machines which attempted whatever task might be set, such as reconnaissance, artillery spotting, air fighting, bombing and so on. Such jacks of all trades were liable to be outclassed in particular respects by anything specially designed for special purposes, and as far as air fighting was concerned a dramatic indication was given as early as May 1915 when the German Fokker monoplane suddenly appeared.

This Fokker was not a very impressive looking aeroplane. More like a Bleriot than the later improvements, it looks after half a century as if with its cycle wheels it must have been out of date even in 1915. But it carried a remarkable device, a synchronizing gear, which enabled its pilot to fire a machine-gun through the propeller without shooting it off. Combat with such a machine was immediately seen to be unequal. Steps had to be taken to regain security in the air, to establish what was later described as air superiority. The result was a 'fighter' race in which the stakes were fire-power, ease of aiming, field of fire, manoeuvrability, speed, rate of climb and the development of fighting tactics. Fighter specialization had set in until, in 1917, there appeared, on the British side, a machine which was actually christened by its role, the Bristol Fighter.

The main purpose of these fighters was to establish a dominance over the opposing air force so that other machines could carry out other functions for which they in turn were specially designed: for example, the R.E.8 reconnaissance aeroplane, which had little chance of survival if it encountered German specialized fighters. Such superiority was wanted that even the old BE2cs would be able to continue their operations. This was the object for which the knights of the air fought—Richthofen, McCudden, Bishop and the rest. So much has so justly been written about these splendid and heroic men. But so little has been written about the nature and objects of the epic struggle in which they were engaged. The development of Royal Air Force doctrine was later to suffer from that.

This battle for air superiority was fought over the trenches. That is where the bulk of the aeroplanes and all the best ones were sent. There and in the immediate vicinity was where most of the reconnaissance, artillery spotting and bombing was done, and that after all is where the decisive battle was being fought. On the British side, ideas such as were developed by the navy for initiating an 'independent' air offensive further afield were not viewed with much favour. Haig's view that everything possible must be concentrated directly upon smashing through the enemy trenches was fully endorsed by Trenchard who commanded the Royal Flying Corps in France.

British strategic bombing more or less withered away. Nevertheless, the bombing which Haig and Trenchard required called for something more than aeroplanes with bombs stuck incidentally into or on to them, and the naval idea had enough strength to stimulate the design and pro-

duction of the first 'heavy bombers', the Handley Pages.

These machines, as weight lifters, were relatively slow and unmanœuvrable. They also had to have much longer range than had hitherto been thought of and therefore, because of the extra petrol they needed, became heavier still. The great question postulated by their very design was how they would survive; but, if this question was asked at all, it seemed to have little relevance. They might fly by night and in any case they were not going to fly in the zones of the high performance fighters. They were not going to the front. They were going far behind the lines. The air as a whole was not thought of as a combat zone; only the air over the front. This was a cardinal mistake but, in the circumstances of the time, perhaps not a very surprising one. At speeds of 100 m.p.h. and less, the air space seemed virtually limitless, and a more pertinent question than how they would survive might well have seemed to be how they would be intercepted.

The German initiative with the Gothas in May and June 1917 certainly underlined the apparent relevance of the latter alternative. The reaction to the Gotha attacks was intense and, in its effects, very rapid indeed. It was akin to the reaction which followed the penetration of Dutch ships into the Medway in Charles II's reign and led to a drastic reform of the navy.

It is strange that this should have been so. The sudden and violent death of 150 people in 1917, even if they were civilians, might have passed almost unnoticed in a year which witnessed the Battle of Passchendaele and the beginning of the Bolshevik Revolution, but it did not. The damage to Liverpool Street Station was such as a compe-

tent contractor might have dealt with in a short space of time and was hardly to be compared to the fate of whole villages and towns in the battle zone. It too might have passed unnoticed, but it did not.

The fact that the British, nourished by a thousand years of virtual immunity from war (if the Scots and their own quarrels are overlooked), expected to preserve their immunity, and the fact that they had little conception of what was happening to that small percentage of them who were, or had been, in the trenches perhaps explains the strength of the popular reaction. And the popular reaction, no doubt, in part accounts for the official one. However that may be, the official reaction did directly lead to the creation of the Royal Air Force and the rapid development of a doctrine of strategic bombing thereafter.

The Cabinet met on 11th July 1917 and the impression that something drastic ought to be done was, no doubt, strengthened by a second Gotha raid on London on that very day. It was resolved that a committee consisting of the Prime Minister and General Smuts should examine:

- (i) The defence arrangements for Home Defence against air raids.
- (ii) The air organization generally and the direction of aerial operations.

This was a crucial moment, perhaps the crucial moment, in the history of strategic bombing. Apprehension had laid hold of men's minds and many were certainly driven by the strong motive of fear. The climate was sympathetic to radical proposals. General Smuts, to whom Lloyd George left the work, was a visionary and far-sighted man.

So far-sighted, indeed, that much of what he wrote in his report seemed to refer more to the age of guided missiles and nuclear war-heads than to that of Gotha bombers and 100 lb. bombs of the war in hand or Lancaster bombers and ten-tonners of the next one.

A less far-sighted, more down-to-earth man operating in a calmer climate might have recommended a few improvements in fighter and anti-aircraft defences and then left the Royal Flying Corps and the Royal Naval Air Service much as they were. General Trenchard himself would probably have done just about that; but not General Smuts.

✓ 'The day may not be far off,' he reported, 'when aerial operations with their devastation of enemy lands and destruction of industrial and populous centres on a vast scale may become the principal operations of war, to which the older forms of military and naval operations may become secondary and subordinate.'

He showed how existing British air power belonged to the older services and was therefore subordinated to their military and naval requirements just as the artillery was. He argued that this subordination of air power could no longer be justified:

'Essentially,' he reported, 'the position of an Air Service is quite different from that of the artillery arm; to pursue our comparison, artillery could never be used in war except as a weapon in military or naval or air operations. It is a weapon, an instrument ancillary to a service, but could not be an independent service itself. An air service on the contrary can be used as an independent means of war operations. Nobody', General Smuts supposed, 'that

witnessed the attack on London on 11th July could have any doubt on that point.¹

Of course, military and naval air requirements would survive the creation of a new and separate air force. The new service would have to detach part of its strength for these auxiliary purposes and those parts might well be placed under naval or military command. Even so one air service should be created and a separate Air Ministry and Air Staff established. Only in this way, General Smuts believed, could an independent air strategy be evolved and carried out.

The essence of this report was, in other words, that, despite such desirable improvements as might be made in the air defence system, the only real answer to the strategic threat from the air was the capacity to mount a strategic air offensive oneself. The administrative implication of this conclusion was the creation of a separate Air Service with a Ministry and an Air Staff.

Thus, to put the matter in yet another way, the only effective answer to a strategic air offensive was a strategic air offensive, and the only effective reason for having a separate air force was to acquire the capacity for mounting a strategic air offensive.

By the time this report had been written, even though it was all done in the surprisingly short space of a few weeks, much of the immediate alarm which had caused it had worn off. The Gothas were already losing their battle. The

¹ The Report was addressed to the War Cabinet on 17th August 1917. It is printed in H. A. Jones: *The War in the Air*, Appendices, pp. 8-14. Oxford, Clarendon Press (1937).

Royal Air Force was in danger of being abandoned before it had been created. Indeed, during the last winter and spring of the Great War the idea of strategic bombing was in danger of strangulation. Nor was this crisis a temporary one, for it is hard to think of any other major method of warfare which, on one hand, aroused such passionate faith and, on the other, such vigorous scepticism.

This conflict between faith and scepticism modified the theory and greatly influenced the ultimate practice of strategic bombing. At this early stage, that is in the final period of the First World War, the issue turned principally upon the war which was still going on in the trenches. This provided the exponents and the sceptics respectively with their trump cards.

Lloyd George and Smuts, it must at least be suspected, doubted if Haig would ever break the German lines and feared that if he did, he would only do so at a cost which would make the achievement worthless. Their judgement, it must be admitted, was perilously close to correct. Those who shared their view tended to see in the coming strategic air offensive an alternative means of escape from the trench war which would not involve a negotiated peace with the Germans. This was the driving force behind the continued effort to create a British strategic bombing force which was to be based in England away from the influence of Haig, and equipped with four-engined Handley Page bombers capable of carrying a substantial load of bombs as far as Berlin.

Haig and his loyal air commander, Trenchard, saw this as simply another diversion or side show on the same lines

as the Dardanelles, Salonika and the rest. The only way to win the war was to pour more and more men, material and support, including air support, into the effort to overrun the German trenches so as to achieve a break-through. The creation of an independent strategic bombing force would, whatever it might achieve, tend to frustrate the attainment of this major objective because, of course, industrial effort, supply and aircrews would be diverted from Flanders to Norfolk, from the German front line to Berlin.

Haig's military judgment was proved by events to be absolutely correct. Whatever else might have happened, there cannot be a doubt that the result of the First World War was determined from the trenches, that the decisive factor was the military break-through and subsequent defeat of the German Army in the field.

This military victory did not, however, resolve the issue. The clarity of it was obscured by the theory, nourished by skilful and persistent German propaganda, which suggested that the German Army was never defeated at the front and died only from wounds received in the back. This theory not only blunted the truth about the military victory which had, in fact, been won, but it did so in a way which offered hope for the exponents of strategic bombing, for it suggested that the decisive theatre had been behind the lines in general and in the sphere of civil morale in particular. In addition, the cost of the military victory was both unprecedented and unforgettable. The scar which was left was deep, festering and enduring. It reflected itself after the war more in an outburst of pacifism than in an acceptance of Haig as a national hero.

Finally, the potential alternative value of strategic bombing could not be dissected, measured and disposed of as, for example, the Dardanelles campaign could be, because, unlike the other 'side shows', the strategic air offensive had not taken place. When the armistice was signed only three of the long-range heavy bombers with which it was to be carried out had been delivered. Orders for the remainder were promptly cancelled and nothing comparable was specified until 1936. It is sometimes said, however unfairly, that Sir William Robertson's military reputation rested upon the obscurity and rarity of his judgements. If so, the reputation of strategic bombing depended upon something of the same sort, for of all the major methods of warfare with which men were concerned in the inter-war years, it was the one which on the face of it could be neither discredited nor established by historical analysis. In this sense, the dispute had an insoluble character.

Such then was the prelude to the development of the theory of strategic bombing which took place in the twenty-one years between the two world wars.

This period in the history of British air power was the one on which Lord Trenchard placed the stamp of his personality. Freed from the requirement of loyalty to Haig and the object of a military break-through from the trenches, this remarkable man, who had previously thought of air power as an integral part of the army, now devoted his fiery nature to the establishment of it as an independent service. His life's work became, in fact, the preservation of the Royal Air Force through thick and through thin. His case turned upon the theory of a strategic air offensive, for without it there was no con-

vincing case for the preservation of a separate air service, just as without it there would have been no case for its creation. For ten years Trenchard was Chief of the Air Staff and for another ten years his influence was a prime factor in the making of Air Staff policy.

The theory which Trenchard fortified was this: the heart of air power lay in strategic bombing of an independent character. Operations in direct support of the army and navy, however necessary they might be from time to time, were subsidiary and diversionary. Fighter defence against enemy bombing was fruitless and had to be catered for mainly as a sop to politicians and other civilians.

This theory had certain defects, but it had one crowning merit. It kept the Royal Air Force in being when nearly every other circumstance favoured its disbandment. Naturally, those who believed that the national interest would best be served by such a disbandment, by the restoration of the *status quo ante bellum*, by the sharing of air power between naval and military requirements, concentrated their criticism and attack upon the theory of strategic bombing and it was for this reason that the existence of the Royal Air Force, as well as the controversial nature of it, came to turn upon the idea of strategic bombing.

This idea was not clearly enunciated. Such definitions as were given were few and loose. Trenchard did not have the facility for expressing his thoughts clearly and it may be suspected that he judged it prudent to indulge this weakness, for what was clearly stated could be clearly attacked. Nevertheless, if largely on the evidence of re-

sponses to challenges offered, it is not difficult to deduce what the theory was.

Its essence lay in the mounting and maintaining of an offensive which was superior to that of the enemy. Maintaining the offensive meant not being diverted from it by auxiliary demands or the needs of air defence. It meant giving priority in production to long-range heavy bombers and in concentrating them strategically upon important targets in the enemy's heartland. A superior offensive meant one which delivered a greater weight of bombs upon the enemy heartland than he could deliver against one's own heartland.

The question of what targets would be attacked remained an open one until the last two or three years of peace, when a series of plans were made for the destruction of selective systems such as oil production, railway communications, electric and gas power and so on. Regardless of all this, Trenchard believed, and repeatedly laid down, that the moral effect of bombing was much more important than the physical. He put the ratio at twenty to one. This meant that the main centres of population were the most desirable targets.

The question of how the bombers would be defended on passage to and from their targets was considered both tactically and strategically. Tactically, they would be defended primarily by evasion. They could make use of speed, changed directions of attack, cloud cover and, if necessary, the cover of darkness. Strategically, they could defend themselves by shifting their attacks on to the sources of enemy air power. In other words, if the tactics of evasion showed signs of exhausting themselves, the

main weight of bombing attack would fall on the aircraft and component factories of the enemy.

Thus, to summarize the theory, the main function of air power lay in strategic bombing and the maintenance of the offensive was a prime requisite. The function of the bombers was to deliver bombs on the sources of the enemy's armed strength and to avoid the manifestations of it. Regardless of an enemy's armed strength and regardless of the victories he might win on land or at sea, his capacity for continuing a war could nevertheless be sapped and then strangled at source. An obvious corollary of the theory was that it would be prudent to avoid major naval or military engagements with the enemy at least until strategic bombing had caused him to begin to stagger.

Naval and military leaders, nurtured in the belief that the function of armed forces was to engage and destroy enemy armed forces, naturally looked at this whole idea askance. Unfortunately most of their criticisms were as loosely expressed and vaguely defined as were the doctrines of the Air Staff itself. It was not difficult for the air force leaders to dismiss them as little more than take-over bids aimed at the Treasury. Moreover, the criticisms were illogical in so far as they revealed a fear of enemy bombing which accommodated strangely with their expectation of British bombing.

There were also other difficulties in the way of the Air Staff which tended to accentuate the controversy in which strategic bombing had always been involved. Britain's armed forces are traditionally, though oddly, regarded as 'defence' forces. Public discussion of offensive aims, including parliamentary discussion, seldom gets down to

substantials. In addition, the very idea of bombing seemed, especially in the 1930s, to portend barbarism and anarchy. Attempts were made to outlaw bombing by international ruling and the British Government subscribed to the aim except, as was cruelly observed, where its own subjects were concerned, for the bombing of colonials as a means of upholding an Empire was thought legitimate. These aspirations found no formal acceptance. The so-called Hague Rules were not ratified and no international prohibitions were enacted. Even so, from the British point of view, there was presently seen to be a prudent side to this morality. Especially did this seem to be so after the rise to power of Hitler.

London was not merely the largest city in the world. It also lay in an exposed and easily found position. London too was a capital city in a formidable sense. It was hard to envisage Britain without London. Britain, in addition, had huddled its population into more concentrated industrial areas than any other country in Europe. If the Air Staff theory of bombing had validity, Britain was perhaps the most vulnerable country in the world and if Hitler's threats and claims were to be believed, Germany was going to have the most powerful bombing force in the coming war, at any rate at the outset.

These considerations led to two major results. The first was the theory of the knockout blow and the second was the creation of a defensive air force. The theory of the knockout blow completed the turn of the idea of strategic bombing through a full circle. It brought the position back to something close to what it had been in the summer of 1917 when the German Gotha attacks on London were

being carried out. From the middle 1930s it appeared, indeed, that when war came, the Germans would have a crushing bombing superiority. If they applied this superiority as the British Air Staff believed would be correctly, that is against the main centres of British population, they might rapidly and decisively bring the country to defeat, chaos and ruin.

To the Air Staff, the answer was much the same as it had been in 1917. Britain must redress her bombing inferiority. A powerful striking force must be built. If it could not match the Germans in numbers it must outmatch them in qualities, the most important of which was bomb lift. The only defence was counter-attack. In 1936, the Air Staff issued a four-engined long-range heavy bomber specification which ultimately produced the Stirlings, Halifaxes and Lancasters of the Second World War. It was the same reaction as that of 1917 which had led to the Handley Page four-engined V.1500 which would have bombed Germany in 1919. In the same year of 1936 Hitler occupied the Rhineland, Mussolini established his empire in Abyssinia and General Franco challenged the Spanish Government to trial by war. Clearly the hour was already late. The heavy bombers were new, in many ways revolutionary, in design. They could not be built easily, and no one could build them in a hurry. They would pose new, and again in many ways unknown, problems of flying and handling. If war came before 1941 Britain would have to start without them.

But a bomber force was not only a weapon to use in war. It was also a weapon with which to deter aggression. The immediate strength of Bomber Command must be in-

creased as much as possible with existing types, Wellingtons, Whitleys and unfortunately Hampdens, Blenheims and Battles. And the front line must not only be increased in real size, it must also be made to look larger than life. Reserve squadrons, which in war would be rolled up into training formations, must in the interval be put in the front line. Everything possible must be put into the 'shop window'.

Such, in outline, was the Air Staff reaction. Obviously, it had grave defects some of which were obvious to the Air Staff. The Germans were scarcely deceived. Anyone could see the tragedy of having to put aircraft like Blenheims and Battles into mass production. Anyone could see the danger of putting reserve squadrons into the front line. But desperate measures seemed necessary to meet a desperate situation. The main point was that the threat of a knockout blow could be met only by building a counter-offensive. Until that counter-offensive had substance, the less bombing there was, the better. The main offensive plans of Bomber Command were, therefore, not intended to be carried out either until Bomber Command had grown to strength or, in a worse case, if it was sooner, until the Germans 'took the gloves off'.

But the government, of course, took advice not only from the Air Ministry, but also from the Admiralty, the War Office, the Treasury and even *The Times*. They also took advice from the Minister for the Co-ordination of Defence, Sir Thomas Inskip.

It seemed that these bombers were a very expensive and somewhat distant prospect. Single-engined fighters, Hurricanes and presently Spitfires, could be produced much

more quickly and very much more cheaply, and they needed only a pilot each to fly them. The top priority, it was decided, should be given not to Bomber, but to Fighter Command. There is evidence to show that, in the Air Staff view, this decision amounted virtually to losing the war before it started, but the decision was enforced. The results were surprising.

The main reason for which the Air Staff had resisted such a policy was that direct air defence had been considered impossible and the main reason for that was the lack of early warning which could be obtained of a bombing attack. This meant that there was no prospect of bringing adequate fighter attack to bear upon the bombers before they had completed their mission and gone. This was the problem to which, in the last years of peace, Sir Henry Tizard's Committee for the Scientific Survey of Air Defence addressed itself. The result of their work was more important in the history of air power than anything which had previously happened since the flight of the Wright Brothers in 1903 and anything which was to happen before the explosion of the first nuclear weapons. This was the harnessing to military purposes of Sir Robert Watson-Watt's radar discovery and, which was not less important, the application of it to the specific problem of air interception. It was this which gave to Fighter Command the early warning and battle direction it had lacked before and which made the aeroplane into a defence against the aeroplane.

The Air Staff saw this and so did the Commander-in-Chief, Fighter Command. Lord Newall, the Chief of the Air Staff, put his weight behind Sir Henry Tizard, and

Lord Dowding gave him the resources and the authority to apply that weight to the immediate operational problem. No scientist in history had previously exerted so immediate a part in the development of a fighting tactic and no scientist in history, probably no civilian in history, had such a big hand in such a decisive victory as that which was won in the Battle of Britain in 1940.

Nevertheless, and despite the excellent manner in which they seized upon the achievement of the Tizard Committee in so far as it affected Fighter Command, the Air Staff made no radical modification of the theory which governed Bomber Command. This was very strange, for if the aeroplane had indeed become a defence against the aeroplane, then the theory of strategic bombing was in need of drastic revision. If it had not, then the priority being afforded to Fighter Command was still wrongly accorded and the support being given to Sir Henry Tizard misplaced.

That question in that form was not posed. The hope now existed that the German bombers would not get through but it did not kill the belief that the British would. In other words, the future of Britain depended upon the aeroplane proving to be a defence against the aeroplane while the future of the Air Staff theory of bombing turned upon it proving not to be.

II. IN ACTION

There were three principal factors underlying the position of Bomber Command at the outbreak of war in 1939. First and foremost and in spite of the buffeting they had received throughout the years of peace, the Air Staff had retained their confidence in the idea of strategic bombing. The essence of this idea was that the central function of air power was to maintain the strategic air offensive by throwing the greatest possible weight of attack upon the heart of the enemy and not being diverted from this purpose either by the diversionary claims of others who could use air power or by the clamour of defensive needs.

Secondly, and in spite of the introduction of radar to Fighter Command, the belief survived that bombers would be able to get through to their targets at night if not in daylight and that the function of Bomber Command was to bomb and not to fight.

Thirdly, Bomber Command still awaited the delivery of its projected four-engined heavy bombers and was, in the meantime, equipped with very inadequate numbers of obsolescent machines. The Germans, on the other hand, were much stronger and, because their failure to introduce new types of aircraft or to evolve plans for their employment was not known, seemed to be very much stronger.

The longer a strategic air offensive could be safely postponed, the better. Time in which to consolidate, expand and re-equip Bomber Command was wanted.

The latter consideration fitted in with the grand strategy which had been agreed with the French of standing generally on the defensive until the armed strength of the alliance had been put on to a more warlike footing and the general feeling, sensed by the public and more or less shared by the allied governments, was that time was for them and against Germany. Hitler, it seemed, had mobilized his strength before the war had begun. His initial strength would be his greatest and the German people, who had already made their sacrifice of butter to obtain guns, would be less well placed than the British and French to stand the rigours of war. If the Germans were to win they would have to win quickly.

But if they could not win quickly, then time would be allowed for the allies, and particularly the British, to convert their financial and industrial strength into military and diplomatic terms, for their superior sea-power to exert its economic pressure through blockade, and, perhaps, for the United States to come into the war. And time, together with the pressure of blockade and bombing, would test the durability of a corrupt and totalitarian régime.

This estimate, if not for France, was right in many of its conclusions, though wrong in much of its basis. The appreciation had failed to recognise the great extent to which the German war economy was screened by reserve capacity. The machine tool position, for example, was much stronger than supposed. Labour had been mobilized

for war production to a much smaller extent than was supposed. In fact, the German war economy was not, as the allies imagined, taut and over-stretched. It contained a large element of slack which remained to be taken up when a crisis approached. To produce a crisis was therefore a greater task than was anticipated. Effective strategic bombing was therefore a more distant prospect and a more formidable objective than was realized. The point to be observed, however, is that this appreciation was an important element in the infrastructure of the allied strategy at the outset of the war. The underlying feature of it was the hope that Germany might be defeated by erosion from the centre as opposed to destruction at the perimeters. Clearly, the principal means of eroding the centre were the naval blockade and the strategic air offensive. The blockade would prey upon Germany's requirements for imports, which were formidable, and strategic bombing would operate, in particular, against key points of vulnerability in her economic system such as oil production and, in general, against the morale of her population. Thus, Bomber Command, despite its initial weakness, appeared to be one of Britain's two best military investments for the future.

The first twenty-two months of the war in one respect reinforced the position of Bomber Command. The German army quickly crushed the French and drove the British into the sea at Dunkirk. German U-boats pinned the navy to a desperate battle of defence in the Atlantic and this, together with the overrunning of most of Europe, gave the blockade the characteristic of the boomerang. Whatever happened in North Africa was a long way from

Hitler's fortress. Britain was left alone and one of her weapons alone had the immediate capacity to strike at least some kind of direct and offensive blow against Germany. This weapon was the heavy bomber. That singular fact was the saving grace of Bomber Command at a time when failure and inadequacy otherwise stared it in the face as plainly as it did the other agencies of Britain's armed strength with the single and glorious exception of her minute but victorious Fighter Command.

Herein, all the same, lay a grim warning for Bomber Command. Britain's contemptible little air force (as Göring implied it was by allowing only a slightly longer time for its elimination than had been needed to wipe out the Polish Air Force) had won a decisive victory against the seemingly enormous offensive air power of Germany. The aeroplanes which Lord Dowding commanded had proved by the middle of September 1940 to be a defence against the aeroplanes despatched by the *Luftwaffe*. The overwhelming advantage which had been supposed to lie with the offensive had proved to be illusory, and this had happened despite another unexpected and enormous advantage which had been conferred upon the German air offensive; the availability of bases in northern France. Britain had become easier to bomb; Germany harder. The Battle of Britain was still a British victory.

The extent to which the implications of this train of thought failed to impress themselves upon the British Air Staff is among the most remarkable of the facts about strategic opinion in the Second World War and if this alone was to be studied most of the British practice of strategic bombing for most of the rest of the war would

become comprehensible. There is, indeed, only one other fact of comparable importance. This was the refusal of the Americans to see the writing on the wall in 1943 and the obstinate determination with which they adhered to a policy of day bombing when all the evidence available showed that it was bound to fail.

The Battle of Britain, though one of the decisive battles in world history, seems to be regarded as a somewhat controversial subject. Certainly, the German objects were mixed and it is true the British victory could not be precisely pin-pointed at the time. It is true too that far fewer German aircraft were destroyed than were officially claimed at the time and, finally, it is true that the Germans continued bombing by night after the battle was over. All the same, the issues were clear and the result incontrovertible. At least this can now be seen to have been so.

The Germans were initially not so much concerned about exactly what they bombed. They were concerned with the object of eliminating the defensive potential of Fighter Command. They sought air superiority over Britain to open the way for an invasion and occupation of the country. Victory in the struggle for this air superiority would have enabled them to carry out their invasion of England, operation *Sealion*. Defeat prevented them from doing so. Thus, the Germans sent bombers and fighters, bombers to destroy the installations and production upon which Fighter Command depended, and fighters to engage the aircraft of which it consisted.

Undoubtedly, they were imperfectly directed and ill-equipped for the task. They hesitated and changed their minds about the best targets and failed to appreciate the

importance of the radar early warning masts. Their bombers lacked fire-power and expected to be hugged by the escorting fighters. The range of their best fighters, the Me109s, was inadequate to give freedom of action inland. Thus, the Fighter Command Hurricanes, which occasionally turned out to be Spitfires, were able to inflict an intolerable casualty rate upon the German bombers and hold their own satisfactorily against the German fighters.

The margin was narrow but none the less decisive. After September the Germans disengaged and tried another tactic, unescorted night bombing. In other words, having failed to defeat Fighter Command in daylight battle, they sought to evade it at night. Fighter Command was left in command of the daylight air and its strength increased by leaps and bounds. Though the night blitz of 1940-41 was painful and damaging, Britain could easily take it; the invasion was put off and Hitler turned his conquering thoughts to other theatres. He lost his best, and, as it turned out, his only hope of winning the war. Lord Dowding's victory was not less important than Lord Nelson's 135 years earlier, and in its immediate effects it was yet more important for, in corresponding terms, Napoleon turned east sooner than Hitler.

Now that Battle of Britain Day has become an annual national event, it may be asked how many who share in the celebration and commemoration comprehend the nature of what is being remembered. Air Ministry hand-outs and official films give them little help. Indeed, the official view of the battle misses most of the point, and this is not just a matter of historical record and academic

interest. It is the key to the practice of British strategic bombing from 1940 to 1944.

The Air Staff analysis of the Battle of Britain showed that the Germans had fought an irrelevant battle. Instead of proceeding immediately to the proper strategic aim, which was the heart of Britain, they had been side-tracked into an unnecessary and unequal struggle against Fighter Command. In other words, instead of evading the opposing armed strength, they had confronted it. Even before the Battle of Britain had begun, the British Air Staff had learnt and applied their own lesson. They had discovered in December 1939 that their own best heavy bombers, which were then Wellingtons, could not penetrate the German air defences in daylight. They had decided to seek the cover of darkness and to apply to Bomber Command not the practice of the daylight formations of Wellingtons and Hampdens of 3 and 5 Groups, but the night tactics of the Whitleys of 4 Group.

This, in the circumstances, was not a surprising decision. Formations of Wellingtons attacking coastal targets in Germany in December 1939 were shot to pieces by German fighters which, after all, proved to have the early warning of radar. In an action on 18th December 1939, twenty-four Wellingtons were despatched in formation to seek naval targets in the Schillig Roads, Wilhelmshaven and the Jade Roads. Two of them returned early, twenty-two flew on to the target area, twelve were destroyed and ten regained their bases. The Wellingtons were engaged by German fighters near Heligoland and the attack upon them was kept up until they were seventy to eighty miles on their homeward journey. It was an unequal struggle.

German radar had provided adequate early warning and the Me109s and 110s had little difficulty in finding their quarry. Having done so, only the inevitable inexperience of their pilots prevented them from winning an even more complete victory. With their cannon, they could have engaged the Wellingtons without coming within range of the latter's guns. Some, nevertheless, closed in to fifty yards and three or four were destroyed, probably for this reason. Even so, their victory was convincing enough to make the prospect of daylight bombing appear very problematical. The Wellingtons had suffered this disaster in an attack which involved no penetration beyond the German coast. Yet half of the force was destroyed and no worthwhile result was achieved.

It could be, and was, argued that stricter formation-keeping, improved armament and, above all, self-sealing petrol tanks might give the Wellingtons a better chance but, as presently became apparent, such measures would, at best, be no more than palliatives. A machine specially designed for heavy bombing was inherently likely to be at a fatal disadvantage whenever it encountered an opposing one specially designed to destroy it. A major offensive by this means would obviously result in the wiping out of the Command's slender resources within a matter of weeks.

Meanwhile, the Whitleys of 4 Group, boring nose-down through the night with loads of leaflets, ranged over all German Europe from the Baltic in the north to Vienna in the south and suffered battle casualties which were negligible and, for weeks in a row, nil. Indeed, after three months' experience of directing operations of this kind, the Group Commander expressed his surprise at the ineffec-

tiveness of the enemy defences. He told the C.-in-C. that it was necessary 'to lower in a surprising degree our opinion of the opposition we expected to meet'.¹ No effective means of night fighter interception seemed possible. Thus, the attraction of night bombing was created not only by the negative and alarming factor of what was happening in daylight but also by the positive one of the experience of the Whitley crews on flights of deep penetration at night. A different emphasis might have been given if it had been realized how seldom the Whitleys were finding their correct target areas, but that was not yet realized. As it was, it seemed that the main hazards to which the Whitley crews were exposed would yield to better de-icing equipment and more plentiful supplies of oxygen.

Then in May and June 1940 Battles and Blenheims of the Advanced Air Striking Force operating from French bases were shot to pieces as they gallantly sought in daylight to arrest the German advance by bombing communications and other military targets.

Finally, with the Battle of Britain came the same lesson in reverse with another. Unlike the British day formations, the Germans had flown with fighter cover. But it had availed them only defeat. It could be, and was, concluded that fighter cover for long-range bombers was essentially ineffective. If the fighters were of the highest performance like the Me109s and Spitfires their range was so small that they could scarcely manoeuvre for battle over England after crossing the Channel. If their range was greater, like

¹ *The Strategic Air Offensive Against Germany*, vol. I, p. 202.

the Me110 or the later British Beaufighter, their performance was inadequate to meet the real interceptor fighters which would come against them. Thus, in daylight, the German air would be commanded by Messerschmitts and the British by Spitfires.

The only opportunity for a sustained strategic air offensive was therefore under conditions in which Messerschmitts and Spitfires could not operate effectively; that is under the cover of darkness. The British and the Germans reached precisely the same conclusion and had it not been for what the Americans decided in 1943, it may be doubted whether it would ever have occurred to anyone to challenge its entire validity.

The British strategic air offensive against Germany began on the night of 15th May 1940 when a force of ninety-nine bombers was despatched to attack oil and railway targets in the Ruhr.

Pre-war studies, known as the Western Air Plans, had placed emphasis upon oil and transport as desirable targets. Their destruction and dislocation would have direct and obvious military consequences and would also have industrial and economic effects. Thus, the choice of these targets appealed both to those who believed that the aim of bombing should be to prepare the ground for military victory and also to those who believed in air power as an independent means of offensive. In addition, it had long been obvious that Germany's oil position would be critical in view of her lack of indigenous resources and her lack of sea power.

The question of whether oil plants and railway marshalling yards could be hit by night bombers had not been

studied. The belief that they could, which presumably lay behind the instructions given on 15th May 1940, rested not on evidence but on hope. Before the war it had been assumed that daylight bombing could be carried out with an average aiming error of three hundred yards. In 1940 this assumption was in some unexplained manner transferred to the expectation for night bombing. Thus, the bombers flew off in search of their targets on the night of 15th May 1940. What had happened on the earlier leaflet raids and a few bombing attacks, such as that on the Island of Sylt in March 1940, indicated that no success would be achieved. Stranger events were to follow.

On 24th December 1940, a daylight photographic reconnaissance sortie was flown over Gelsenkirchen at which two of Germany's key oil plants were situated. According to the Bomber Command statistics, one of these plants had at that date been attacked by 162 aircraft carrying 159 tons of high explosive bombs. The other at the same date had been attacked by 134 aircraft carrying 103 tons of high explosive bombs. In addition, many incendiaries had also been dropped. The photographs showed that both plants were in full operation and that neither had suffered any serious damage. A report to that effect was shown to the Chief of the Air Staff and the C.-in-C. Bomber Command on 28th December 1940. On 7th January 1941 the Chiefs of Staff advised the War Cabinet that Bomber Command should be given oil targets, including Gelsenkirchen, as its sole primary aim. This advice was accepted on 13th January and on 15th January a bombing directive was issued in which the C.-in-C. was told 'that the sole primary aim of your bomber offensive, until further orders,

should be the destruction of the German synthetic oil plants'.¹

This was an extraordinary decision made more extraordinary by the fact that a powerful body of opinion, led by the Prime Minister himself, favoured, not an oil offensive, but a direct attack on German morale through the destruction of towns as a whole.

The oil offensive had not long been under way when it was halted. In March the grave position which had been reached in the Battle of the Atlantic led to a diversionary directive turning Bomber Command on to targets which were judged to be of naval significance, and the oil offensive was destined not to be resumed until 1944. By April 1941 Air Staff studies indicated that the average night aiming error was more than three hundred yards. A thousand yards was mentioned as a more likely figure. This was considered to make oil targets tactically invulnerable, and to those like the Secretary of State for Air who were keen oil advocates the Chief of the Air Staff had to explain that 'the most suitable object from the economic point of view is not worth pursuing if it is not tactically attainable'.² This elementary principle was presently to have far-reaching consequences.

Meanwhile, the thousand yard error was considered good enough to make a transport campaign against key points in the west German railway system tactically attainable and such a plan was the one put forward by the Air Staff when the temporary Battle of the Atlantic directive

¹ The directive is printed in *The Strategic Air Offensive Against Germany*, vol. IV, pp. 132-3.

² *The Strategic Air Offensive Against Germany*, vol. I, p. 168.

expired in July 1941. An underlying feature of this plan, however, was that precision bombing such as was required to hit marshalling yards could be achieved in good moonlight conditions. 'It follows therefore,' an air staff appreciation stated, 'that for approximately $\frac{3}{4}$ of each month it is only possible to obtain satisfactory results by the "Blitz" attack on large working class and industrial areas in the towns.'¹ Both these aspects of the plan were written into the bombing directive of 9th July 1941.

Thus, to summarize the position which had now been reached, Bomber Command had started the war with the intention when the time was ripe of attacking precise and highly selective targets in daylight. Early experience had shown that day bombing was impossible. Bomber Command turned with the same plans to night attack. Experience then indicated, though for a time the indications were ignored, that at night only semi-precise targets as large as marshalling yards could be hit and these only when the weather was clear and the moon was out. When the weather was not clear or the moon was in, the only thing which could be hit was a large industrial area. This was the position which had been reached in July 1941 and recognized in the directive of the 9th of that month.

In effect, this position amounted to a policy of area bombing. It only required a thorough investigation of the limitations which darkness imposed upon bombing accuracy and a development of night fighter tactics, which would make bombing yet more dependent upon darkness, to make it absolute.

¹ *The Strategic Air Offensive Against Germany*, vol. I, p. 173.

The first of these conclusive developments occurred in August 1941 when, at the instigation of Lord Cherwell, Mr. Butt submitted a report on night bombing which was based upon a statistical analysis of the bombers' night photographs, that is, the photographs which were taken as the bombs were released. The report suffered from certain limitations which were imposed upon it by the nature of the evidence available. The cameras in use allowed scope for human error and the documentation accompanying the photographs was found to be incomplete and much of it in literary rather than statistical form. The sample was relatively small. All the photographs examined had been taken during operations which were carried out in June and July 1941. They referred only to twenty-eight targets and to forty-eight nights. There was doubt as to whether cameras were issued to the supposedly best crews or the worst ones. Cameras, indeed, were the subject of confusion and even suspicion in Bomber Command. The confusion arose from prolonged discussion as to whether the primary aim was for reconnaissance photography or position checking. The suspicion proceeded from the fear that the crews might be demoralized by the feeling that the camera was an official spy.

For these reasons, the Butt report had in some quarters a somewhat stormy reception. In addition, its findings made depressing reading. It seemed that, of all the bombers which were credited with having attacked their targets, only a third had in fact got within five miles of them. The proportion varied according to the area concerned. Over the Ruhr it was only one-tenth.

These findings showed that Bomber Command had not

yet reached the stage of having a bomb-aiming problem. The navigational problem, to which scant attention had been paid, was, to a substantial extent, preventing it from reaching its targets at all. The reaction was of major importance. Excuses and qualifications were brushed aside by the Prime Minister and Lord Cherwell. A decisive impetus was given to the introduction of radar navigation aids to Bomber Command, of which, in the summer of 1941, there were none whatsoever. It was rapidly established in Bomber Command that the main object of night photography was to record the position of the aircraft when it dropped its bombs and the resulting photographs presently became the principal means by which the performance of each crew was judged. Bomber Command was thus firmly set upon a more systematic, a more realistic and a more scientific approach to its goal. Realism about what that goal was asserted itself in February 1942 when the Chief of the Air Staff firmly underlined the point that in its general attacks Bomber Command was to aim at the centres of the towns and not at individual factories within or near them.

It therefore becomes clear that the decision to confine Bomber Command mainly to night action, which was taken in April 1940, resulted inevitably in a policy of attack upon whole German towns, the policy of area bombing. All the arguments based on strategic and economic reasons which have gone on since and, surprisingly, still go on, about the alternatives of this or that kind of attack are wholly groundless for operational reasons alone. The alternative to area bombing was either no strategic bombing or daylight bombing. In the circumstances of the

time, the idea of abandoning strategic bombing was scarcely a practicable proposition though there were those who presently claimed that it might have been.

Operationally, the idea of area bombing was to attack an aiming point which lay at the centre of a large area whose destruction would be useful. It was, in other words, a method of making bombs which missed the aiming point contribute to the destruction of the German war machine. Since nearly all the bombs were missing the aiming point, there was a certain logic about the idea.

Strategically, the idea was supported by the knowledge, not universally shared, that individual industries made poor targets because of the difficulty of discovering all the related components which comprised them and the possibilities which existed for switching other industries in substitution for those damaged and so on. These possibilities open to the Germans were indeed very seriously underestimated in Britain, but they were sufficiently estimated to lend support to the idea that a general dislocation of housing, public services, water and gas mains and so on would have the more efficient effect. Thus, there were overwhelming operational reasons in favour of area bombing and powerful strategic ones too.

All the same, as is evidenced in the directive of February 1942, the Air Staff saw a future for selective precision bombing in support of general area bombing. They hoped that radar devices might in time make this at least to some extent possible at night and in 1942 they still hoped that the possibility of day bombing might be reopened. This was the position which had been reached in February 1942 when Sir Arthur Harris arrived at High

Wycombe to assume command of the bomber force.

A number of drastic measures designed to improve the quality of Bomber Command now began to come to fruition. In March 1942, a radar aid to navigation, known as *Gee*, came into operational service and at the same time the first Lancaster bombers arrived in the front line. The bomber crew was reorganized. The second pilot was dropped. Separate and specialist navigators and bomb aimers were introduced. In August 1942, after much argument and some delay, the Pathfinder Force was created. In December 1942, a radar aid to bombing or marking, known as *Oboe*, came into service and, in January 1943, *H2S*, a radar aid to navigation and bomb aiming, was introduced. *Gee*, which in pedantic terms was not radar since it did not depend upon echo, enabled the navigator to determine his ground position rapidly and with a much higher degree of accuracy than had previously been possible except by visual observation of the ground. Its range, however, as had been anticipated, was presently restricted approximately to the Dutch coast by German jamming. *Oboe* was yet more accurate than *Gee* but for much of its operational life was restricted to the range of the Ruhr Valley. It could, in addition, be used only by a small number of aircraft at the same time. *H2S*, whose transmitter was carried in the aircraft, had unlimited range but, except over targets with special characteristics, was difficult to interpret. It also gave notice to the enemy of the position of the aircraft using it. Nevertheless, in spite of their limitations and disadvantages, these remarkable devices provided the opportunity for a revolutionary improvement in the accuracy of Bomber Command's naviga-

tion and even contributed something to the solution of the bomb-aiming problem. The Lancaster bomber was the best of its class which appeared in the Second World War. It had the capacity to lift a ten-ton bomb. It was robust and reliable in action and, on targets of equal risk, suffered a lower casualty rate than its equivalent versions, the Halifax and the Stirling. Like them, it had not, however, the capacity to survive in combat with opposing fighters.

The creation of the Pathfinder Force established the principle of a specialized target marker element in Bomber Command and ensured that special study would be given to that particular and formidable problem. The theory that the Pathfinder Force should always receive the best crews and the best equipment was not, however, always implemented in practice and, if it had been, there might well have been a deterioration in the quality and morale of the main force. Nevertheless, and especially after the introduction of efficient marker bombs, the Pathfinder Force, by providing a clearer aiming point, did bring about a great improvement in the concentration of bombing.

The reorganization of the bomber crew also had effects of real value. At the beginning of the war, the heavy bomber crew consisted of a pilot, a second pilot and a band of what, in general, could be described as gallant amateurs. It was long believed that two pilots were essential, though in practice the second pilot seldom had much to do. Largely as a result of the experienced persistence of Air Vice-Marshal MacNeece-Foster, the second pilot was at last dispensed with and the effort required to expand the

strength of Bomber Command was thereby much reduced. At the same time, Flight Engineers, who could be quickly trained, were introduced, the Observer was relieved of gunnery and bomb-aiming, rechristened as the Navigator and allowed to specialize in that subject. Separate and specialist Bomb Aimers were introduced and the bomber crew became a team of highly specialized experts. In the Lancaster, Halifax and Stirling, it consisted of a Pilot, who was also the Captain, Navigator, Bomb Aimer, Wireless Operator, Flight Engineer, Rear Gunner and Mid-Upper Gunner. This served for the rest of the war. Had it not been done, the thousand-bomber attack on Cologne could not have been carried out in 1942 if only because there would not have been enough pilots to man the force.

These things were the basis of Bomber Command's operational capacities for the most of the rest of the war. They did not make a return to day attack possible and they did not make precision bombing at night possible. The main force of Bomber Command, until the summer of 1944, found that where major German targets were concerned its operational limit was area bombing of large targets, increasingly effective and accurate area bombing, but area bombing all the same. This fact is often misunderstood because some elements of Bomber Command were in this period capable of much more precise achievements. The classic, if extreme, example is provided by 617 Squadron which, in May 1943, breached the Möhne and Eder dams. This was, perhaps, the most accurate bombing attack ever carried out in the whole of the Second World War and it was certainly one of the greatest feats of arms

achieved by the Royal Air Force or any other air force. The bombs had to be dropped from exactly sixty feet and the acceptable aiming error was about the length of one man. This was done by Wing Commander Gibson and the crews he led, though not without crushing losses. This showed what could be done but it did not show what could be done by the main force. Indeed, it took many months to find suitable replacements in 617 Squadron for those who were lost on that famous night. Wing Commander Gibson, and those who followed him on the dams raid, were men of exceptional skill, courage and operational experience. They had also had to be withdrawn from the line for a considerable period before the attack to work up the special equipment required and practise the special tactics evolved. Moreover, the Möhne dam was only lightly defended and the Eder dam not defended at all. Even so, the attack, which embraced other dams as well, cost 617 Squadron eight of the nineteen Lancasters despatched. Yet, after the summer of 1944, the same kind of main force with substantially the same equipment found the capacity to bomb in daylight and to carry out pin-point bombing at night.

The explanation of this is to be found in the German air defences. This consideration approaches the crux of the whole subject. That crux is, perhaps, most conveniently described by the term 'command of the air'.

The basic difference between the operations carried out by Bomber Command, on the one hand, between September 1939 and July 1944 and, on the other, between August 1944 and May 1945, was that, in the first period, the force operated without command of the air and, in the second,

with it. In the first period, the strategic air offensive produced results which, whatever else they may have been, were not decisive, while, in the second period, bombing smashed the capacity of Germany to continue the war. It is difficult to see how different bombing policies in the first period could have been adopted and how, if they had been adopted, they could have made any substantial difference to the results achieved. But in the second period, the achievements of the offensive were directly governed by the bombing policies adopted.

These observations clarify what is meant by the term 'command of the air'. It will be apparent that the extent of it is to be measured by the extent to which bombing policy governed bombing achievement. This, in turn, depended upon the extent to which the enemy air defences dictated the bombing policy of the attacking forces. Effective enemy defences will render impossible a decisive bombing policy. Ineffective enemy defences will permit one to be adopted.

The contrasting situations produced by these two conditions are revealed by considering, on the one hand, the general area offensive of Bomber Command between March 1942 and March 1944 and, on the other hand, the final phase of the campaign from the summer of 1944 until the end of the war in Europe.

The test which Bomber Command went through in the mounting area offensive of 1942-44 embracing the Battles of the Ruhr, of Hamburg and of Berlin, was whether, while evading the German air defences under the cover of darkness, the heavy bombers could nevertheless bring such pressure to bear upon German towns or anything

else they could strike that a decisive result would be achieved or, secondly, that the handicap of trying to see in the dark would prove too severe a penalty for the bombing in terms of accuracy or, thirdly, whether the tactical conditions of daylight would gradually invade the night and, so to speak, remove the cover of darkness.

For much of 1942 it seemed that darkness was reducing accuracy by a fatal margin. For much of 1943, it seemed that this obstacle had been overcome and that the bombers would strike a decisive blow under the cover of darkness. By March 1944, it became clear that the area offensive had fallen short of its goals and that Bomber Command was facing destruction by night fighters just as earlier it had faced destruction by day fighters.

In 1942 Bomber Command achieved a number of dramatic successes which did much to restore confidence in the idea and the future of strategic bombing in the minds both of the crews who were carrying it out and of the government who were considering what priority should be given to Bomber Command in production and supply. The most notable of these successes were a highly precise attack in March upon the Renault works at Billancourt near Paris, a remarkably destructive area-attack upon Lübeck also in March and the first of the thousand-bomber operations against Cologne at the end of May. In the Renault attack a new technique of target marking with flares was successfully initiated. Both the concentration and the accuracy of the bombing were excellent and few of the buildings in the complex escaped damage. In the Lübeck attack Bomber Command used a higher proportion of incendiary bombs than previously and the poten-

tial for self-destruction of an inflammable town of medieval basis was exploited. Some two hundred acres of its central area were devastated. The thousand attack on Cologne, which was made possible by calling the operational training units into the front line, caused severe destruction to nearly half of the great city. Even so, the Ruhr, which was the prime target in this period, and especially Essen, proved to be a much more difficult target. The combination of industrial haze and concentrated defences kept it beyond the new techniques of Bomber Command. In eight major attacks on Essen in March and April, it appeared on the evidence of the night photographs that only about 10 per cent of the aircraft which bombed did so within five miles of the aiming point.

The successes of Bomber Command in 1942 were far exceeded in 1943 and the previous failure against the Ruhr was eclipsed by the huge destruction wrought between March and July in that highly industrialized area by what soon became famous as the Battle of the Ruhr. Against the precise attack on the Renault works could now be set the much more precise one of May 1943 upon the Möhne and Eder dams. Against the devastation caused in Lübeck and Cologne could now be set the catastrophic firestorms which ravaged Hamburg at the end of July in the Battle of Hamburg, and against the decline of the offensive in the winter of 1942 could now be set the beginning of the huge Battle of Berlin in November.

In this period there was a great quantitative and qualitative expansion in Bomber Command. In January 1943, the average number of aircraft available with crews for operations was 515. This included 178 Lancasters and 17

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Mosquitoes. By March 1944, when the Battle of Berlin ended, the average had increased to 974 and it then included 594 Lancasters and 58 Mosquitoes. The Mosquitoes played a singular part which was of greater importance than their mere numbers suggested. With their high speed and high ceiling they enjoyed a high degree of immunity to the German defences and showed themselves to be the ideal platform for *Oboe*, which depended upon straight and level flight for accuracy and high altitude for range.

Indeed, these Mosquitoes were the key to the success achieved in the Battle of the Ruhr. They were the means by which the Pathfinder Force, now also equipped with efficient marker bombs, succeeded in providing the main force with clear aiming points in the Ruhr Valley. Thus, Essen and many neighbouring industrial towns lost the protection of industrial haze and searchlight dazzle which had previously so largely saved them. Many had their hearts torn out between March and July 1943 and it seemed that Bomber Command was well advanced on the way to a decisive achievement.

This hope received further encouragement by the even more impressive result of the Battle of Hamburg. Once again this was due to the success of the Pathfinder Force in providing clear and accurate aiming points for the main force. Though beyond the range of *Oboe*, Hamburg gave an especially good response to *H2S* which detected the contrast between land and water most clearly. In four major attacks, rapidly succeeding each other, Bomber Command flew more than three thousand sorties to Hamburg and dropped nearly nine thousand tons of bombs,

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about half of which were incendiaries. The Americans also attacked in daylight. More than forty thousand people were killed and nearly as many again injured. Nearly a million fled the city. Large areas of it ceased to exist and Hamburg did not again during the war recover full production. The German minister responsible for war production, Albert Speer, believed at the time that six more actions of that kind might bring Germany to her knees.

In the pursuit of this object, Bomber Command reached out to Berlin itself and on the night of 18th November 1943 the first of sixteen major attacks upon the capital, which took place between then and the end of March, was launched. These operations involved the despatch of more than nine thousand sorties, over seven thousand of which were flown by Lancasters. Berlin, far beyond the range of *Oboe*, was a poor *H2S* target. The extent and density of the built-up area was such that accurate identification of particular points was always difficult and often impossible. The concentration of bombing achieved was less than in the Ruhr towns and very much less than in Hamburg. The effects of it were therefore far less damaging. And Berlin, because of the importance which the Germans attached to it and the range at which it lay, was a very dangerous target. So far from maintaining the rising tide of success achieved in the Battles of the Ruhr and of Hamburg, Bomber Command encountered in the Battle of Berlin a diminishing rate of destruction and an increasing one of casualties. As the battle drew to a conclusion a crisis was reached.

By March 1944, the night offensive of Bomber Com-

mand, despite its enormous successes, had failed to achieve a decisive reduction in German war production or a decisive break in German morale.

It is sometimes argued that this undeniable fact is not conclusive because the area-bombing offensive had been sapped of much strength by diversions and disputes about bombing policies. A further development of the area offensive would, it is argued, have produced much more striking consequences. But this hypothetical argument leaves out a cardinal fact which is not hypothetical. This is the fact that by March 1944 the German air defences had got on top of the night bombers and were inflicting an insupportable casualty rate upon them. In March 1944, Bomber Command was no longer in a position to sustain a major night offensive against German cities. In fact, the tactical conditions of daylight had invaded the night to the extent where the cover of darkness had been fatally compromised. The night bomber never had the capacity to fight. It now also had an inadequate capacity to evade.

In 1939, the main hazards which the night bombers had to face came from flak and the weather. Night-fighting tactics were in their infancy and interceptions could scarcely be made except by chance. In the thirty-five major actions between November 1943 and March 1944, German night fighters destroyed the majority of the 1,047 British bombers which failed to return. The daily average of bombers available for operations in the front line during this period varied from just over 800 to just under 1,000, so that, within five months, the German air defences, and principally the German night fighter force, destroyed more than the equivalent of the whole front line

of Bomber Command. This happened in spite of the most brilliant tactics of evasion through radio counter-measures and other methods which could be devised.

From the earliest days of the war the Germans had made use of radar in their system of air defence. The fighters which intercepted Bomber Command's Wellingtons on 18th December 1939 had been forewarned by a radar method which was similar to that developed for Fighter Command in Britain. But as Bomber Command made increasing use of radar for its own offensive purposes so the scope for the Germans to detect the transmissions and use them as a guide for their own fighters grew. Thus, the measures which were designed to enable Bomber Command to operate more effectively in the dark had the unfortunate effect also of enabling the German fighters to do the same. This, in turn, offered Bomber Command scope for attempting to neutralize or mislead the German radar system, and from the end of 1942 onwards a series of ingenious measures and devices came into operational use. One of the most successful was *Window*. This consisted of thin metallized strips of paper which were dropped in bulk by the bombers approaching their target, or by others making a feint at some point removed from the real target. *Window*, by producing a radar response, could confuse the defences and, in the Battle of Hamburg, when it was used for the first time, it did so to an impressive extent.

The Germans, however, showed great skill in detecting the nature of such devices and in adjusting their tactics to overcome what were usually not more than temporary difficulties. During the five months of the Battle of Berlin,

Bomber Command was being screened not only by *Window* but by a large variety of highly complex measures of radar deception. Without such measures, the casualties would, no doubt, have produced total disaster. As it was, and even with all these measures, they proved to be prohibitively high. Obviously, if Bomber Command was to remain in being as a striking force a halt to casualties of this order had to be called, and, in the circumstances of March 1944, the only way to call it was by halting the offensive. In fact, at this stage, there is no doubt that the race by Bomber Command to destroy Germany before the German night-fighter force destroyed Bomber Command had been won by the German night-fighter force. The policy of evasion had exhausted itself. The full gravity of this critical situation was at the time concealed by a fortunate coincidence; the coincidence that this was the moment at which Bomber Command was diverted for other reasons and temporarily given as its primary aim the direct preparation of the allied invasion of Normandy.

One of the principal aspects of the plan was the dislocation of the French system of transport so as to neutralize the German advantage of operating upon interior lines of communication. This meant that a great part of the bombing effort was switched from distant targets in Germany to nearer ones in France. It also meant that Bomber Command operations divided into a series of different attacks on the same night, for in France, of course, saturation bombing was not the object. On the contrary, the aim was to destroy specific installations and to cause the minimum number of civilian casualties. The German night-fighter force was therefore denied the obvious target of the large

and concentrated bomber streams, which had characterized the great area-attacks on German towns, and, because of the shorter range, given a much shorter time in which to detect and intercept.

Yet within another three months Bomber Command joined with the United States bombing forces in a strategic attack upon German targets which proved decisive and, but for tragic errors in its conduct, would surely have proved decisive more quickly than it did.

Some have seen this extraordinary outcome as no more than the final exploitation of all the cumulative erosion which had gradually been achieved since 1940 but the real explanation is different and more complicated. An understanding of it depends on going back to 1942 and observing the arrival of the American Eighth Air Force bombers in England. The Americans thought little of the idea of area bombing. Their diplomats, business men and journalists had, of course, still been in Germany during the most ineffective phase of its application in 1940 and 1941. They believed that precision attacks upon key targets, such as those envisaged by the British at the outset of the war, were the key to effective strategic bombing. They therefore resolved to operate in daylight. Since they had no fighters to go the distance, they put powerful armament into their Fortresses and Liberators and devised formation tactics designed to make the most of massive firepower. They expected their bombers to fight their way to and back from their targets.

The British knew that this would not work, but the Americans were reluctant to be instructed and the British hesitated to press the point because they knew that the

advocates of strategic bombing in Washington had to contend with the advocates of the maritime and military applications of air power. Thus, the American bombers went into action. In 1942, while operations were experimental, largely within range of friendly fighters and not aimed at German targets anyway, the results were quite encouraging. In 1943, when the Americans turned to German targets and began to outstrip their own and the British fighter ranges, a very different prospect emerged. The German fighters tore into the American formations and executed a terrible slaughter.

The solution adopted was to concentrate the bombing offensive against German fighter production and its supporting components. In June 1943 both the American day, and the British night, bombers were given this aim as their first priority. The Americans, in day precision attacks, would pick off the aircraft factories and ball-bearing plants and the British would dislocate towns associated with these kinds of production.

Of course, as Sir Arthur Harris understood well enough, this was absurd. The aircraft industry was, perhaps, the most difficult target in Germany. Many of its most important components lay at extreme range. Much of it consisted of small and widely dispersed units. This whole idea, in fact, amounted to an attempt to make a difficult task possible by attempting a more difficult one. Nevertheless, the bombers were committed to a race between the destruction of the German fighter force in production by the bombers and the destruction of the bombers by the German fighter force in being.

The result was a decisive victory for the German

fighters in being. In October 1943, after a period of disastrous casualties which culminated in the famous Schweinfurt operation, the American day bombers had to call a halt. Schweinfurt, as the greatest centre of German ball-bearing production, was believed—though not by Sir Arthur Harris—to be a target of supreme importance. The United States Eighth Air Force attack of 14th October 1943 did severe damage to it but only at a cost in American crews and aircraft which even the power of the United States could not sustain. An armada of 291 Flying Fortresses set forth with substantial fighter cover and the outward journey was more or less uneventful until the area of Aachen was reached. This was the limit for the fighter cover and from that point onward the Fortresses came under severe attack from cannon and rocket-firing German fighters. Sixty of the Fortresses did not return to England and another 138 did so in a damaged condition. This frightful outcome produced a severe reaction in the United States and meant that operations of that character had to be discontinued forthwith. Within six days and from four attacks, 148 American bombers had failed to return to their bases. The German fighter force was still increasing in strength. The attempt to achieve command of the air by bombing had failed. The reason was that without command of the air bombing could not be effective.

This was a critical moment. With less inducement in similar circumstances both the British and then the Germans had turned to night bombing and had embarked upon the self-defeating path towards the exhaustion of the tactics of evasion under the diminishing cover of darkness.

In contrast to the British and the German, the American bombing policy had an inflexibility of purpose which, in theory or in a staff college manual, could easily have been defined as contrary to basic principles and common sense. Their bombers and bombing equipment had a corresponding inflexibility of function which, in theoretical specifications, could easily have been condemned as short-sighted. It was, in fact, impossible for the Americans to turn to night attack. Their crews, highly trained in the formation tactics of day bombing, had little training, and most of them none at all, in the navigational problems of night flying. Moreover, their B.17 Flying Fortresses gave out very conspicuous exhaust flames. The British Chief of the Air Staff, Lord Portal, who had once hoped that the Americans might convert themselves into a night force, had estimated that if this was to be done by the beginning of 1944 the decision to do it would have to be taken before the end of 1942. No such decision was taken and the Americans therefore had no available operational alternative to the policy of day bombing in which they had so vigorously believed. In the circumstances, this defect was providential. Something had to be done to make good the practice of day bombing. The only thing which could be done was to get high performance fighters into action against the Germans, to mount a bomber and fighter offensive. The German fighter force in being had got to be cloven out of the sky. After October 1943 the Americans turned their powerful attention to this problem and, marvellous to relate, the possibility of a solution was provided by December.

This solution consisted of the P.51 Mustang, an aircraft

with perhaps the strangest history of any in the Second World War, but certainly one of the most important ever produced in the history of military aviation. It achieved what had long been regarded as a technical impossibility, that is, the range of a heavy bomber and the performance of an interceptor fighter. It was the instrument which released the potential of the strategic air offensive.

Before the war, the Americans had given much thought to the problem of a long-range fighter but nothing, apparently, had turned up and when their bombers went into action they did so on the principle of the self-defending formation. The abandonment of this self-defeating idea was, perhaps, somewhat delayed by the confident, if somewhat premature, assertion of the Eighth Air Force Commander, General Eaker, that it was working well, and it was only after the intervention of a civilian that a radically different idea began to prevail.

This intervention was due to Mr. Robert A. Lovett, the United States Assistant Secretary of War for Air. In June 1943, after a visit to the Eighth Air Force in England, he told General Arnold, the Commanding General of the United States Army Air Forces, that long-range fighters would have to be brought to the rescue of the bombers, and this lesson, if it still needed to be, was driven home by the Schweinfurt operation of October 1943.

Mr. Lovett had urged that the Thunderbolts, which on the Schweinfurt operation had to turn back at Aachen, should be given long-range tanks. He had also said that Lightnings and Mustangs would be needed. At first, it had seemed to General Arnold that the Lightning was the best prospect and numbers of this curious-looking double

boom aircraft began to be diverted from the Middle East to England. Something much better was, however, also to hand. This was the Mustang. That this was so was due, not to American foresight, but to an extraordinary chance.

In 1940, when the British were anxious to lay hands upon almost any aircraft, their Air Commission in the United States placed an order for Curtiss fighters with North American Aviation. That firm suggested the production of a new machine and the suggestion was accepted by the British representatives. Eighteen weeks later the prototype of the North American 73 Mustang was ready. The British ordered it, but the Americans, after testing two models, were not impressed and did not. Quantity production began at the end of 1940 and the Royal Air Force received its first operational Mustangs in November 1941.

At this stage, the American rejection of the Mustang seemed reasonable. The performance of the machine was unimpressive and it fell off as altitude was increased. The maximum speed at 15,000 feet proved to be 366 m.p.h. This was not good enough for Fighter Command and the Mustangs were relegated to Army Co-operation Command for low-level work. This might well have been the end of the Mustang saga, but to Rolls-Royce it seemed that the main defect of the aircraft was due to its being underpowered. They made calculations of what might happen if one of their own Merlin engines was substituted for the original Allison of 1,150 horse power. In consequence, Merlin 61 engines were installed in five Mustangs and the first of these was flown in October 1942. The result, according to the test pilot, was not good, but the experiments

were continued. The airframe was modified and the Packard-Merlin engine was tried. The result was the P.51B Mustang which proved to have a sensational performance.

Speed now increased with altitude from 375 m.p.h. at 5,000 feet to 455 m.p.h. at 30,000 feet, and even at 35,000 feet 440 m.p.h. was possible. Thus, the new Mustang could outpace the German F.W.190 by nearly 50 m.p.h. up to 28,000 feet and by about 70 m.p.h. above that height, and it was faster at all heights than the other leading German fighter, the Me.109G. Its manoeuvrability was also excellent. It could outdive both the F.W.190 and the Me.109G. It could easily out-turn the Me.109G and slightly out-turn the F.W.190. It had a similar rate of roll to the Me.109G and in this respect alone could be surpassed by the F.W.190. Here then, by a curious route, was a supreme interceptor fighter.

Owing to its ability to carry long-range fuel tanks, the Mustang, however, was much more than a supreme interceptor fighter. By September 1943, tests had proved that, with these tanks, the Mustang could cover nearly 1,500 miles and, what was more surprising, sacrifice only 35 m.p.h. of its performance while carrying them. This, allowing for combats, would enable Mustangs to cover bombers up to a range of six hundred miles from base, and that, as events soon proved, was much less than the limit.

The Americans were still strangely lethargic about the prize which was under their noses. It is true that in July 1943 General Arnold told Mr. Lovett that the P.51B had emerged as the best solution of the long-range fighter

problem but his directives provided for the despatch of only 180 of them to support the Eighth Air Force in its operations against Germany. It was the Schweinfurt operation of October 1943 which changed all this. Immediately thereafter a crash programme of Mustang production was set in motion and top priority was given to getting them into action in support of the bombing offensive against Germany. Between then and the collapse of Germany, 14,000 of these splendid machines were produced. They first went into action with the Eighth Air Force bombers in December 1943, and by March 1944 their range had been extended to the maximum necessary, that is, to the extent that, flying from England, they could afford the American bombers fighter cover up to the eastern limits of Germany. Thus, the United States showed that they possessed the power and the resources to recover a situation which had been almost lost and from which it may be doubted if any of the other combatant nations could have recovered.

The arrival of the Mustangs and the vigorous use of them which was made by the Commander of the Eighth Air Force fighters, General Kepner, changed the course of the war in the air. Growing numbers of Mustangs made not only their own crucial and direct contribution to the air battle but also an indirect one of comparable importance. It was due to them that the huge forces of shorter-range fighters, including large numbers of British Spitfires, were at last brought into effective offensive action in the same air battle; the battle for command of the air over Europe. Previously, these shorter-range fighters had been largely denied that opportunity because

the *Luftwaffe* could avoid action simply by holding off until the attacking bombers passed beyond the range of the covering fighters. Thus, before the Mustangs arrived, the *Luftwaffe*, unless it chose to give battle, had little to fear from allied fighters in its task of providing for the air defence of the Reich. After the arrival of the Mustangs, this immunity was removed and the *Luftwaffe* had to offer its defence wherever it could. This often brought it under Spitfire, Thunderbolt and Lightning guns.

The Americans did not for long repeat the German mistake of tying their fighters down to close bomber escort. Their mission was to hunt and kill wherever they could. They did so with devastating effect and growing confidence. In February 1944, the American bombers resumed the major offensive which they had been forced to break off in October 1943. In consequence of the reaction of the *Luftwaffe*, an enormous air battle over Germany began. The Mustangs came into their own. By March 1944, just as they were claiming their greatest air superiority at night, the Germans lost command of the air in daylight.

In March 1944, undertaking operations of a most ambitious kind, 3.5 per cent per raid of the American bombers which attacked targets failed to return. In October 1943 this loss rate had been 9.1 per cent which was nearly twice the maximum which could be afforded by a bomber force which meant to stay in business. Thereafter, American bombing operations became more and more ambitious while the cost of them became less and less. Even Bomber Command, which was untrained in daylight tactics, whose aircraft had less ceiling than the Americans and carried

only 303 guns, began to find that it was cheaper in many circumstances to bomb by day than to attempt evasion by night.

Sir Arthur Harris urgently demanded a long-range night fighter offensive as a means of restoring the position at night and bringing it into correspondence with that which had been established in daylight. He recognized clearly that tactical devices to assist evasion, such as feint attacks and marking, divided operations, diversionary routing and radio counter-measures were exhausting themselves. He recognized, in fact, that the German night-fighter force could no longer be sidestepped and that it must be eliminated. He explained this to the Air Staff in April 1944. His conclusion with regard to the conditions of night attack was in essence the same as that reached by the Americans about day attack in the autumn of 1943.

Thus, both the great bombing forces came in the end up against the same harsh facts: bombers alone could not survive in their own element and strategic bombing could not be sustained unless a condition of air superiority was created for them; air superiority was a question of bringing the opposing and defending air force to its knees; the alternative of attempting to neutralize the opposing air force by evasion was ultimately a self-defeating one.

No equivalent of the Mustang came at night to the rescue of Bomber Command. In so far as its salvation was due to fighter intervention at all, it was due to the Mustangs and other long-range day fighters themselves more than to the long-range night fighters which, as a result of Sir Arthur Harris's call, sought to bring on an air battle

at night, though not on such a large scale as Sir Arthur Harris had wished. He knew that his bombers could not defend themselves and he knew too that even if their armament was improved they still would be unable to do so. He told the Air Staff that, 'Remedial action is therefore an urgent operational matter which cannot be deferred without grave risk. Already,' he added, 'the cost of attacking targets in the Berlin area under weather conditions which give good prospects of accurate and concentrated bombing is too high to be incurred with any frequency.'¹ The remedial action which Sir Arthur Harris had in mind was a long-range night-fighter offensive and for this he demanded ten squadrons of Mosquitoes. He got only three.

It may be thought that the Mustang miracle might have been repeated by Mosquitoes at night if more heed had been paid to Sir Arthur Harris's demand, but this seems unlikely. The long-range night fighters were dependent upon the radar equipment which they carried for finding their targets. Owing to the limitations of that equipment, it was difficult to distinguish friend from foe and as the number of British fighters trying to do so increased, so the amount of time which they wasted in stalking each other increased. Between May and September the success of the Mosquito night fighters in engaging German night fighters declined by between seven and two hundred fold depending upon the particular equipment in use. It is improbable that the actual number of German aircraft destroyed in the long-range night fighter offensive will ever be known

¹ *The Strategic Air Offensive Against Germany*, vol. III, p. 147.

but the total number claimed by fighter squadrons of 100 Group between December 1943 and April 1945 was only 257. Indeed, the Second World War never sufficiently turned the night into the day to enable opposing fighters to grapple effectively with each other at night and the conditions for a decisive victory in the sense of that won in daylight after the introduction of the Mustangs were never created at night.

Nevertheless, this daylight victory did open a chain of events which led to the collapse of the German night fighter force. First, it created, to put it mildly, a discouraging climate for the *Luftwaffe* in general which was undoubtedly unhealthy for the morale of the force. Secondly, there was a further dislocation of training and practice flying which, in addition to the long-term results, had some immediate ones. Thirdly, and which was more important, daylight superiority enabled the American bombers to begin an oil offensive in May 1944. This, in addition to the initially very costly night attacks on oil plants by Bomber Command, which began in June 1944, quickly produced a petrol famine which had a highly disastrous effect upon the *Luftwaffe*. Fourthly, and most important of all, the allied break-out from Normandy in July 1944, which also owed much to daylight air superiority, resulted in many German night-fighter bases in France being lost and to the overrunning of the early warning radar chain. Thus, in August 1944, the German night-fighter force was no longer able to operate effectively, and Bomber Command's vast destructive power together with its various and by now highly developed techniques of night precision bombing were released.

Anti-aircraft fire was not at night a great killer of aircraft flying at reasonable altitudes and, in the final phase of the war from August 1944 until the end, Bomber Command's worst enemy, as it had been at the beginning, was the weather.

At the beginning, by entering the German airspace at night the bombers had laid claim to a kind of air superiority. The German night-fighter force had not come into being. This had the effect of driving the *Luftwaffe* on to the defensive with, for Britain, the fortunate consequence that the main weight of bombing fell, not on her, but on Germany. Much has been made of this significant achievement especially by those who were serving in the Royal Air Force before the war because it does, of course, provide one of the vindications of the Air Staff doctrine of the bomber offensive. Apart from the fact that there were, in addition to the Bomber Command initiative, other reasons which also contributed to the defensive posture of the *Luftwaffe*, it is a mistake to confuse, as is often done, the driving of an enemy air force on to the defensive with the attainment of command of the air. It is, in fact, no more than a preliminary step in that direction for the command of the air depends, not upon forcing the enemy to defend, but upon denying him the means to do so.

In the final phase, Bomber Command enjoyed the fruits of a real command of the air. The *Luftwaffe* had suffered defeat, the German night-fighter force had come and gone. No effective defence against bombing could be offered and such German successes as occurred were few and temporary. Average bomber casualties per attack fell to 1 per cent and then even lower. It became six times safer to

attack targets which were often by their nature and location six times more dangerous.

In the final phase, Bomber Command had acquired the strength and techniques to make decisive use of the opportunity. More than a thousand four-engined bombers and eventually more than a thousand Lancasters could operate in a single night. The weapons available, ranging from the 22,000 lb. *Grand Slam* to the clustered 4 lb. incendiary bombs, were formidable and effective. The techniques, which allowed for a high concentration of attack and a remarkable accuracy, permitted consistent results against objectives which varied from single structures, such as canal banks and railway viaducts, to precise areas in great cities.

Indeed, the difference between Bomber Command's strength and skills in 1944 as compared with those of 1940 indicates a feat of military and industrial organization allied to scientific and technological application and operational research which must rank with the greatest of Britain's achievements. In addition to all this, the huge United States Strategic Air Forces had also been released from a losing battle and, in spite of its substantially smaller bomb lift and slightly lower degree of bombing accuracy by comparison with Bomber Command, similarly looked out upon a transformed prospect.

These strategic bomber forces had the possibility of bringing the German war machine to a dead halt and it seems reasonable to suppose that they could have done so within 1944. By April 1945 they had done so. Their operations were decisive. They could have been decisive sooner.

There were in this final period three great strategic aims, or target systems as they were described in the jargon of the time. All were operationally feasible. They centred respectively upon oil, transport and general dislocation. There were also the wars on land and at sea to be fought and to be supported by the heavy bombers. There were in addition, anxieties about a possible revival of German air power through jet propulsion. There was thus a multiplicity of tasks most of which could individually have been tackled by Bomber Command with devastating and rapid result but all of which together, if this result was to be achieved, were beyond its potential.

The establishment of an effectively overriding priority among these alternatives proved to be impossible. The air force leaders could not, and did not, wholly reject the requirements of the other services. Moreover, a complete priority was operationally impossible because even the diminished German defences still had to be kept divided and because of weather considerations. Under ideal circumstances, a complete concentration of effort would have been impossible. Nevertheless, the concentration achieved was less than it could have been. This was due to divisions of opinion within the air force high command. The Chief of the Air Staff, Lord Portal, was a convinced advocate of the oil plan. The Deputy Supreme Commander of the Allied Expeditionary Force, Lord Tedder, was dedicated to the transport plan. The Commander-in-Chief, Bomber Command, Sir Arthur Harris, was still unconvinced by selective plans and continued to have burning faith in the idea of general dislocation.

Thus, concentration was lost, time passed and the Rus-

sians advanced. The compromise, which saw the destruction of the *Tirpitz*, the felling of the Bielefeld viaduct, the reduction of Gelsenkirchen and the devastation of Dresden, amounted to the fatal undermining of the German capacity to continue the war. It amounted to a decisive victory for strategic bombing but the clarity of that victory was obscured by the arrival in Germany of the also victorious allied armies whose advances owed so much to it.

III. IN RETROSPECT

It is to be hoped that the foregoing pages have established an adequate reference to the circumstances, decisions and facts which governed the origins and conduct of the strategic air offensive in the Second World War. To complete the study, these now need to be related to the post-war views of bombing which have been extensively, and sometimes ably, canvassed by retired officers, journalists, scientists, novelists, Church leaders and politicians.

As is well known, these views conflict with one another to a remarkable extent and amount to what is now called the 'bomber controversy'. It may, then, be well to start with three fundamental points about the offensive; its cost, the proportion of war effort devoted to it and the result it achieved.

Bomber Command's operations cost the lives of 55,573 aircrew and those of a further 1,570 who served on the ground staff. The cost then to Britain, the Commonwealth and the incorporated allies was 57,143 dead. The strategic air offensive over Western Europe claimed about 7 per cent of the manpower which was absorbed by all the British fighting services during the war. It would be

interesting to know what proportion of war production was devoted to the needs of the strategic air offensive. It may have been in the region of 10 per cent but it is doubtful if an accurate estimate can be made. The result of the Anglo-American strategic air offensive was, in the end, the decisive destruction of Germany's capacity to continue the war through the destruction of her oil production and lines of communication and the dislocation of her means of repair and recovery. The resulting weakness opened her to naval and military defeat. A fundamental factor in all this was the achievement of command of the air to which strategic bombing made an essential contribution.

All these statements, if they are to bear analysis, require explanation and some qualification. In theory at least, there are alternative methods or comparative methods by which cost and proportion might be measured. The whole question of results is extremely complex and embraces a mass of indirect consequences. Nevertheless, the essentials are conveyed by the generalized statements made.

Bomber Command's casualties were, absolutely, grievously high. Bomber Command lost more aircrews in the Second World War than the British Army did officers in the First.¹ As a proportion of the men engaged, they were also very high but, in proportion to the results achieved in a massive campaign of more than five years' duration, they

¹ For the origin of the idea of this comparison see C. E. Carrington, *Daily Telegraph*, 2nd October 1961. Different elements of the population are, of course, involved but both had it in common that they were small groups exposed to peculiar hazard.

were surely very low indeed. In relation to the casualties incurred in three years of trench warfare between 1915 and 1918 they were almost negligible. As a means of waging war against a far superior military power, strategic bombing was, on this count, exceedingly economic. Moreover, by no means all Bomber Command's casualties were due to strategic bombing. There were also massive tactical operations in support of armies and navies.

The small proportion of British fighting manpower devoted to Bomber Command was certainly of high quality and in some cases of the very highest quality. It would, all the same, be difficult to sustain the argument that the other branches of the armed forces suffered any measurable penalty from the recruitment of Bomber Command. Of course, if Bomber Command had been abolished or operated on reduced resources either long-range aircraft or aircraft productive potential would have been released for other purposes. Maritime air patrols might well have been stronger sooner. The Battle of the Atlantic might well have been a less close run affair.

The virtue or otherwise of these observations must be largely governed by what strategic bombing achieved. If the result of the war would have been the same without strategic bombing then clearly none of the cost of it was worthwhile. If the victory which was won could not have been won without the bombing offensive as it was, then equally clearly the cost was not only worthwhile but cheap at the price.

These two propositions represent the extremes of the post-war controversies which have developed about the offensive ranging from the viewpoint of say Sir Robert

Saundby to that of say Sir Charles Snow.¹ Obviously the truth lies well to the centre, for the bombing offensive, while it made an important contribution to victory, could, in theory at least, have made a greater one.

But, in this whole question of cost, there is another factor which, in the eyes of many of the critics, is more important than those already mentioned. This refers not to the uniformed aircrews killed or the inroads made by Bomber Command upon the other branches of the armed forces, but to the ununiformed German civilians killed, to the German towns devastated and to the works of art destroyed and so on. Even this, the moral issue, must to some extent be governed by what the bombing achieved in terms of the defeat of Hitler's Germany, for clearly there is a difference between destruction for the sake of destruction and destruction for the sake of victory.

It seems therefore reasonable to conclude that the three main points of examination to which the strategic air offensive should be exposed are first, the extent to which it was inefficient or, to put it the other way round, greater results might have been obtained from it, secondly, the extent to which its strategy was in sympathy or in conflict with the grand strategy of the war and thirdly, the question of whether it was morally legitimate or not.

In considering these three questions, there are clearly two standards of judgement which must be applied and compared. One depends upon what it is reasonable to expect in the circumstances of the times at which the

¹ See, for example, Sir Robert Saundby: *Air Bombardment*, Chatto & Windus (1961); Sir Charles Snow: *Science and Government*, Oxford University Press (1961).

events occurred and the decisions were taken. This corresponds to the verdict of a trial by jury. The other depends upon all the circumstances of which we now, not much less than twenty years after the last relevant event had occurred, have knowledge. This corresponds to the verdict of history. It is essential in both cases to use the word 'corresponds' since obviously an individual can aspire neither to the wisdom nor the folly of a jury and one historian cannot presume to identify his own historical judgement with the verdict of history. He can offer no more than his own conclusion.

Also, in considering these three questions of efficiency, strategic conformity and morality, there are a number of superficial obstacles to clear vision which have to be examined if only in order to filter from the air sufficient debris to make the visibility worthwhile.

In the first place, it must be admitted that the scope for misconceptions about air warfare is greater than in the cases of naval and military operations. At least people everywhere know that battleships cannot sail across land masses and that armies cannot march on the water. It is also clear that the marshalling, deployment, supply and control in action of an army is a highly complex business as it is also clear that the commanding of a fleet at sea is a subject to which a whole professional career can profitably be devoted.

In the case of air power a different view seems to prevail. Neither the corresponding basic limitations concerning such matters as range, altitude, vision and so on nor the corresponding tactical complexities are appreciated. It may be said that in the case of naval and military operations people tend to look at the path to the goal and to

attempt a measurement of the obstacles, whereas, in the case of bombing, they tend to choose the target and assume its destruction.

Nor does this apply simply to the so-called 'man in the street'. A remarkable ignorance about the capacities of aircraft revealed itself elsewhere. Look, to mention only one example, at the Air Raid Precautions arrangements which were made in the war. The authorities were clearly near the point of concluding that a match struck in the blackout would illuminate a target.

In general, there is a severe underestimate of the tactical and operational limitations to which aircraft were subject in the Second World War and therefore also the general suggestion that the strategic choices open to Bomber Command were much wider than in fact was the case.

Much of the resulting argument makes no more sense than would the suggestions that Lord Gort made a serious mistake in not driving the German armies back across the Rhine when they launched their attack on the West in May 1940. But in the case of bombing, strategic criticism, even when operationally unfounded, often seems to be reinforced by moral indignation and moral indignation often seems to have more to do with the formation of views about strategic bombing than do the strategic pros and cons of it. This need not be objectionable but it becomes so when, to serve a moral argument, Bomber Command is given in retrospect a function which, operationally, it could not have performed.

In nurturing this basic ignorance and in creating this woolly thinking, officials have played their part. It is, of course, a truism that war-time communiqués provide a

source for the study of war propaganda and not for the study of war, but the handling of Bomber Command by the official public relations experts had particularly unfortunate consequences. Apart from the general glossing over of all failures and the constant exaggeration of all successes, which was not peculiar to the Air Ministry, there was a more or less constant concealment of the aims and implications of the campaign which was being waged. Attacks on great towns were announced but somehow or other, especially when questions were asked, the impression was given that specific targets such as armaments factories and the like were being aimed at. The damage to the residential and central areas, which were in reality the main aim of the area attacks, was ascribed to what could unfortunately not be avoided if the factories and so on were to be hit.

Thus, the impression was created that Bomber Command could aim at factories during the long period of the war in which it could not, and when, as sometimes emerged, it became clear that it had aimed at a town centre, the impression was created that it chose to do so in preference to and as an alternative to aiming at factories. Thus, from what one can only assume was a fear of moral indignation, moral indignation was created and in time more than moral indignation. The ultimate reaction was a deep feeling of shock in the sense of surprise.

Public announcements in war time must, of course, be given the licence of concealment and even distortion. For example, a statement which led the enemy to think that a capital ship was ready for action when, in fact, it was out of action, or even at the bottom of the sea, might

be most valuable. There must too always be the aim of encouraging one's own people and depressing those of the enemy. But the distortion of the aims of Bomber Command served neither of these purposes and only created the most unfortunate consequences.

Even so, there were extenuating circumstances. One of the motives must have been the sense of insecurity which the air force had. To admit that some of its pre-war claims could not be realized might have played into the hands of naval and military critics. This is a reminder of what has been suffered from inter-service rivalry and it seems that there was a failure to draw into a common and higher loyalty what were certainly the most dedicated and patriotic elements in society, namely, the armed forces.

This timidity on the part of the Air Ministry publicists no doubt also received encouragement from the emotive nature of the very word 'bomb' and from the British euphemism for attack which is defence.

In this connection it is worth remembering that at the turn of the century the word 'bomb' became associated with terrorism and anarchy. It was after all 'bombs' which the revolutionaries threw at order in Russia, in Spain and elsewhere and, even if English liberals sympathized with those who sought to overthrow Tsar Nicholas or King Alphonso, they clearly had no taste for their weapons. Long before the appearance of bomber aircraft, bombs were connected in people's minds with the collapse of authority, the destruction of life and property and the abolition of security.

The bomber aircraft, as the German Gothas showed in 1917, was a particular affront to an island and maritime

people who were not used to witnessing enemy explosions in their midst. In the Sino-Japanese war and in the Spanish Civil War bombing made outraged headlines more readily than other kinds of military action. With weapons one killed; with bombs one murdered.

But with bombers one also 'attacked' which created a kind of verbal contradiction between Bomber Command and the organization of the British armed forces, in which everything possible is labelled as defensive, for example, the Committee of Imperial Defence, the Ministry of Defence, the Defence Staff, the White Paper on Defence, the Defence Forces and so on. Moreover, the navy went to sea to defend sea communications, the army went to France to defend the West, Fighter Command took the air to defend towns but Bomber Command took off to attack Germany. Of course, in reality, there were defensive and offensive aspects of Bomber Command's operations as there also were of most other kinds of operations at sea, on land and in the air but there was, in Bomber Command's aims, something apparently more nakedly offensive than all could readily digest.

These considerations go beyond mere explanations of the timidity of Air Ministry publicists during the war. They begin also to explain a trend of public reaction to the idea of strategic bombing which, in the absence of fundamental moral opinion or of strong strategic argument, was likely to assert itself, and which, to a great extent, has done so. There is, in addition, another more specific factor of greater immediate relevance which, through the passage of time, tends to be overlooked.

In 1940 and 1941 the British people received a real

shock and fear was an important ingredient of their finest hour. It cannot be doubted that the cutting edge of Fighter Command in the Battle of Britain and after was sharpened by the desperate plight of the country and the disasters which had overtaken her armed forces in Norway, France, Greece, Crete, the Mediterranean and the Atlantic. It cannot be doubted too that the plight of those in the bombed cities and towns of London, Coventry, Hull, Manchester, Plymouth, Southampton and the rest was rendered more endurable by the hope that the Germans would get from Bomber Command as good as they were giving. Indeed, the British are not such a placid people as they try to imagine. Cornered and wounded, they became very dangerous and with virtually one accord they sprang, through Bomber Command, which was the only weapon to hand, at the throat of their seemingly invincibly superior opponent.

Perhaps they surprised themselves by the vigour of their reaction and when the need for it had passed and the dangers which aroused it had been overcome they became aware of a sense of guilt. Because they knew so little of what Bomber Command was trying to do in 1941, 1942 and 1943, they later permitted themselves to ask whether, had they known the truth, they would have approved it.

This is a generalized view of a public reaction which cannot be *contrôled* by specific measurements, but surely it contributes an element of explanation to the views of strategic bombing which exist today. It gives a basis of understanding of the prejudice which exists about strategic bombing, in contradistinction to the understanding of it and it provides a clue to the separation of criticism

which proceeds from emotional as opposed to rational criteria.

With such a distinction in mind, it is now possible to turn back to the rational criteria of efficiency, strategic conformity and morality, which have been already adumbrated.

As to efficiency, it must be observed that in the first three years of the war Bomber Command achieved a very small degree of operational success in the sense that with minor exceptions it lacked the power to inflict important damage upon the targets which it attacked. But in the course of 1942 the turning point was reached and area bombing began to offer a serious threat to German cities, as was demonstrated in particular in Cologne and Lübeck.

In 1943 the power of area bombing became formidable. Huge devastation was caused in the Ruhr, in Hamburg, in Berlin and elsewhere. The foundations were also laid which later contributed to the ability of Bomber Command to make precision attacks upon specific targets. But, in spite of all this and of the initiation of the American daylight offensive, the effects upon the German capacity and will to continue the war were remarkably small. Moreover, as the Americans learned in October 1943 and the British in March 1944, the prospects of the offensive were growing bleak since the bomber casualties were becoming insupportable.

In the first half of 1944, the long-range bombers successfully opened the way for the military invasion of France by cancelling the German advantage of interior lines of communications; and in the second half of 1944 and opening months of 1945 they struck direct strategic

blows at the sources of the German war effort which removed their foundations.

The question is whether these ultimately decisive results could have been achieved more quickly or more economically. Three years without notable operational success is a long time. More than a year of operational success without strategic recompense is also a long time. It is to be asked if the wrong targets were being attacked or if the attacks were less efficient than they might have been.

Throughout the war, the greater part of Bomber Command's effort, about three-quarters of it, was devoted to area bombing in which the aiming points lay at the centres of the major German cities. The reasons for which particular cities were chosen varied. Sometimes, as in the case of Lübeck, they were chosen because it was considered that they were operationally vulnerable. Sometimes they were chosen on grounds of general size and importance. Such was the case of Hamburg and Berlin. Sometimes they were chosen because of association with particular industries. Such was the case of Schweinfurt. And sometimes they were chosen because of special situations connected with other aspects of the war. Such was the case of Dresden. But essentially, and until the middle of 1944, which excludes Dresden and includes the others mentioned, they were chosen because Bomber Command could not effectively hit anything smaller than a sizable town.

Thus, until the middle of 1944, there was a certain degree of choice between various towns but there was no choice between area attacks on towns and other kinds of

more precise bombing, that is if targets in Germany were to be attacked in force.

After the middle of 1944 there was often, though not always, a choice between area attacks on towns and precise attacks on oil plants, railway targets and other installations. Owing to deep disagreements, the effort was divided to a greater extent than it need have been and it seems virtually certain that Germany's downfall could have been accelerated if a greater concentration had been achieved. Operationally it could have been achieved. If it had been, some months might have been taken off the duration of the war. As it was, in the crucial last three months of 1944 in which Bomber Command dropped some 163,000 tons of bombs, about 53 per cent of the effort was devoted to area attacks on towns, 14 per cent to oil plants, and 15 per cent to railways and canals. The machinery for the control and direction of Bomber Command and for the co-ordination of effort with the American strategic air forces proved in the end to be weaker than the destructive potential of the bombers. When Lord Portal believed that oil production was being underbombed, Sir Arthur Harris believed that devastated cities were being allowed too much recovery time and Lord Tedder thought that the death grip on communications was being relaxed. There was justice in all these points of view. That none prevailed over the others was tragic.

This is, no doubt, a severe criticism and it is not made less severe by the consideration that it is the sort of criticism which can be made about most victorious campaigns which deserve to be subjected to the same critical appraisal as ones which end in disaster usually are.

To summarize the conclusion so far, it can scarcely be argued that for the greater part of the war the choice of targets was strategically wrong. In the last part of it, on the other hand, though profitable targets were attacked and destroyed, there was an unnecessarily wide dispersion of effort among too many target systems.

In spite of this, the strategic results obtained in this last phase of the war were of decisive importance and the operational capacities developed were very impressive indeed. The question therefore arises as to whether such capacities could have been developed earlier.

In considering this, the distinction between the Bomber Command of 1944-45 and the Bomber Command of earlier years must be constantly kept in mind. The Bomber Command of 1944-45 had much increased quantity and quality by comparison with the earlier periods. It had a much expanded front line, it had a much higher proportion of Lancasters and Mosquitoes in that front line, it had better weapons, including the two Wallis specials, the 12,000 lb. *Tallboy* and the 22,000 lb. *Grand Slam*, which made impossible tasks like the felling of the Bielefeld Viaduct possible. It had a high degree of navigational and bomb aiming accuracy which proceeded from the development of specialized tactics and the introduction of scientific aids.

Many of these and other important advantages might possibly have been introduced earlier. The Air Staff before the war had been slow to grasp the technical complexities of operating a long-range night bomber force and dilatory in applying the necessary measures after the war had begun and the force was revealed as lost in the dark.

Improvements could have come more quickly if a more realistic approach had been adopted. But if more Lancasters and fewer Halifaxes and Stirlings had been built earlier and if the bombers had been given better bombs and more advanced equipment sooner, these facts alone could not in themselves have changed the main characteristics of the offensive.

All these improvements gave Bomber Command the capacity to achieve decisive results when the opportunity arose. None of them, nor all of them in combination, afforded the opportunity. That depended upon the achievement of command of the air. The essential difference between the period of Bomber Command's decisive operations in the last nine months of the war and any previous phase of the campaign lay not in the increased size of the force nor in its increased efficiency, important as these factors were. The essential difference lay in the fact that, in the terminal period, Bomber Command was operating within the command of the air and that in all other periods it was not.

It therefore becomes evident that the strategic criticism to which the conduct of the offensive is open rests hardly at all upon the choice of targets and almost wholly upon the failure to appreciate the fundamental requirement of effective bombing, namely the achievement of command of the air.

The cardinal mistake was to prepare and launch a campaign which made scarcely any provision for the destruction and neutralization of the opposing air force in being. The theory of the self-defending bomber proved to be illusory. The theory of penetration by evasion proved to

be self-defeating. The whole belief that the bomber was revolutionary in the sense that it was not subject to the classical doctrines of war was misguided. In a sentence, the preference, whether conscious or otherwise, for the teachings of Douhet over those of Mahan was disastrous.

It seems probable that, had the basic doctrine of the air force been centred upon the object of seeking and destroying the opposing air force from the earliest days, then Bomber Command would have had a high chance of achieving decisive results much earlier than it did. Its destructive potential in the summer of 1943 would have been sufficient for the purpose.

Historical judgements with all the advantages of hindsight and none of the terrible responsibilities which press upon those who have to take decisions in war or in preparation for it are, however, one thing. The achievement of corresponding decisions in the circumstances of the time are quite another. As to the selection of targets in the last phase of the war, it was perfectly evident to all immediately concerned, the Chief of the Air Staff, the Commander-in-Chief and the Deputy Supreme Commander that there was a penalty to be paid for unnecessary dispersion of effort. The difficulty was to decide which point of view should be given the overriding priority. This was basically a question of intelligence about the enemy and the interpretation of it, but it was also a question of making the maximum use of the flying time available in a period which included a hard winter. Sir Arthur Harris's insistence upon the virtue of general area attack was justified neither by the contemporary intelligence available nor by the subsequent investigations which have been made.

Lord Portal's single-minded faith in the oil plan perhaps tended to make inadequate allowances for weather conditions but it was substantially justified by subsequent investigations. Lord Tedder's belief in a combination of oil and transport bombing was the most realistic of the three ideas and it was the plan which in all the circumstances of the time should reasonably have been afforded a virtually unqualified priority for the strategic air offensive. It did play a major part, but a virtually unqualified priority was more than it received.

On the question of command of the air no such clear cut conclusion can be reached if one is looking for what might reasonably be expected in the circumstances of the time and it seems not very surprising that the development of air doctrine took what can now be recognized as the wrong turning. The solution was found largely by chance and there is no reason to believe that it could have been predicted except largely by chance, and, of course, even the prediction of it would by no means have guaranteed the provision of an effective solution. The production of an effective long-range fighter was an exceedingly difficult thing to achieve.

As to strategic conformity or to the extent to which the strategic air offensive was in sympathy with the grand strategy of the war, it is often said that it was not, in the sense that the bomber offensive was a jealously guarded instrument of private or isolated warfare. There was certainly a feeling in naval and military circles that Bomber Command conducted its operations without due regard to such major elements in the war as the Battle of the Atlantic or the Normandy campaign.

On the whole, these are groundless criticisms. Naturally, there were people who hoped that strategic bombing would, in itself, cause the collapse of Germany, that bombing alone could win the war. But this was not an expectation which was reflected in the bombing policy adopted, nor was it considered a likely outcome by those in the highest authority. The aim of strategic bombing, as was repeatedly stressed in the directives, was to undermine Germany to a point at which her capacity to fight would be fatally weakened. In other words, it was to open the way for military victory. The Chief of the Air Staff, Lord Portal, predicted in December 1942 that the German fighting services would retain their discipline to the last.

It seems abundantly clear then that the aim of strategic bombing was properly subordinate to the general aims of the war or to its grand strategy. There was never any question of it being a private war left to the so-called Bomber Barons though some of the forthright statements and reactions of Sir Arthur Harris may occasionally have given that impression.

Nor must it be forgotten that a great deal of Bomber Command's effort was directly harnessed to the needs of other campaigns and other services. Among the major causes of diversion were the Battles of France and Britain in 1940, the Battle of the Atlantic throughout the war, the campaign in the Middle East for much of it, the invasion of Normandy and the counter V. weapons campaign in 1944 and army support of various kinds thereafter. These diversions involved not only thousands of sorties by Bomber Command aircraft against targets including the *Scharnhorst* and *Gneisenau*, the Biscay U-boat bases, the

Tirpitz, and those involved in the pre-invasion railway plan, but they also involved the transfer of Bomber Command Squadrons to Coastal Command and the Middle East, and the absorption of some of its Operational Training Unit output. Indeed, up to 1942, the transfer of squadrons was a not unimportant factor in the slow expansion of Bomber Command. It is notable that in November 1941 Bomber Command had an average daily availability of aircraft with crews of 506 whereas in May 1942 the figure was 417.

The full extent of this diversion cannot be calculated. Targets were often bombed for a combination of reasons. But there is certainly evidence to refute the accusation that Bomber Command failed to play a big part in many campaigns other than the strategic air offensive. In the last three months of 1944 when oil, its first priority, claimed about 14 per cent of its effort, 13 per cent was devoted to enemy troops and fortifications directly connected with the land battle. All too often, especially earlier, Bomber Command was ill-suited to these auxiliary tasks; but that is a different question.

As to the moral issue and on the assumption that in a justified war only pacifists object morally to the conduct of campaigns on land and at sea, it is clear that many more than pacifists object morally to the conduct of a strategic bombing campaign. In the 1930s the protest on principle against military preparation came by and large from pacifist opinion. Today it does not. On the contrary, the protest now comes by and large from what may be described as 'pro-war' opinion, that is, opinion which seeks to make war safe, decent and therefore, though this is not much

stressed, possible. The introduction of nuclear weapons is a prime explanation of this change but the link between the protest of the 1930s and that of the 1960s is provided by the strategic air offensive of 1939-45.

Certainly the number of people who regret the introduction of nuclear weapons far exceeds the number of nuclear disarmers and certainly too there are many more than pacifists and nuclear disarmers put together who believe that strategic bombing in the Second World War marked the beginning of the descent of war-morality down a slippery slope.

It is natural and inevitable that major wars should produce major reactions. What is not inevitable is that these reactions should be allowed to flourish in isolation, for, by allowing that, one of the few practical advantages which may be extracted from the study of history is sacrificed. In this connection, the two world wars need to be regarded as a single field of study. It may then be seen, in general terms, that four years of trench warfare produced, on the one hand, the protest view that war must be abolished, and, on the other, the remedial or alternative military view expressed, for example, in the idea of strategic bombing. In other words, one reaction amounted to the wish for no more war and the other to the wish for a better kind of war and particularly no more trench war. Five years of strategic bombing then contributed powerfully to the present day protest view of the nuclear disarmers which almost links with the remedial or alternative military view expressed in the idea of limited warfare, which refers in particular, of course, to war without nuclear strategic bombing.

There is thus a somewhat circular element in the development of thought under this heading. An important arc within that circle refers to the strategic air offensive of the Second World War.

The moral objection is concerned not so much with the amount of death and destruction as with the type of it. The victims of strategic bombing are liable to include women and children, old-age pensioners, neutrals and one's own or one's allies' prisoners of war. The destruction is liable to embrace not only military objectives in the sense of barracks, strategic railways and ordnance factories, but also ordinary industrial installations, housing, hospitals, churches, museums and art galleries. This is the characteristic of bombing which earns for it the term 'indiscriminate' and which seems to distinguish it from other methods of waging war except, perhaps, naval blockade which may cause indiscriminate starvation though not indiscriminate destruction.

Arising from this, there are a number of distinctions which have to be considered. Among them are the differences between destruction in or outside the 'battle zone', of 'military' or 'civil' objectives; of objectives which are defended or undefended; and of destruction which is the product of the aim or incidental to it. There is also, some people think, a moral difference between any kind of destruction which is provoked and therefore retaliatory, and that which is initiated independently.

If, however, these considerations are applied to the actual conditions of the Second World War, as opposed to theoretical circumstances, sizeable difficulties and obscurities begin to emerge. German bombing of Warsaw and

Rotterdam, to take two examples, were held at the time to be provocative in the sense that they justified massive strategic bombing in retaliation by the Royal Air Force. But these attacks were within battle zones and their object was to cause the surrender of the military garrisons in those towns. They can be argued to have been in the same moral category as the artillery fire which the Germans poured into Strasbourg in the war of 1870-71. In that sense they are not comparable to the British bombing of Hamburg or Berlin or the German bombing of London or Coventry. Does this then mean that Warsaw and Rotterdam were military targets and that Berlin, Hamburg, London and Coventry were not? The distinction begins to lose any relevant meaning. It makes no difference to the women and children and it depends basically upon how far the army has advanced. It is impossible to digest the argument that an action which will benefit the army is necessarily more moral than one which will not. Surely the morality must be determined by the war aim and not by the particular arm which is pursuing it.

The theory of the undefended or open town is also, of course, closely linked with the land campaign. It would, in a military campaign, be immoral to destroy an undefended town simply because it would be quite unnecessary. In an air campaign, however, this is by no means the case for the town may be open to no other threat. In consequence, an effective way of defending one's most important targets would simply be by not defending them.

The distinction between damage aimed at and that incidentally caused is a much more important one. There can be no circumstances which would create a moral

justification for seeking the destruction of a cathedral, a hospital or a lunatic asylum as such. On the other hand it is surely a different matter when, as happened, the cathedral was incidentally hit in Cologne, or when, as also happened, a lunatic asylum was bombed because it was mistaken by the Pathfinder Force for the Skoda Works.

Retaliatory justification, on the other hand, has very complicated implications. Direct retaliation may depend less upon moral justification than military ability. Measures against prisoners of war which might be designed to protect one's own men who are prisoners cannot be considered until one has captured some. Again, Britain in 1940 was not in a position to retaliate against Hitler's action in overrunning several independent states by overrunning several more. Even if the word retaliation has a pejorative meaning, it must surely be recognized that there is no narrow moral argument to justify the view that all counter offensive must be in the same kind as the offensive. There is at least the possibility that Britain had the right to reply to superior military power with superior air power. Bombing can be justified for reasons other than enemy bombing, though in the cauldron of war propaganda this may not always be in sight.

The real question which surely remains when all these academic points are done with is whether or not the methods by which victory in war is sought are morally permissible or not. The answer may to some extent be qualified by the amount of incidental damage likely to be done but it seems that the two most important considerations are first, the causes for which the war is being fought and the nature of the enemy, for the means adopted must

be in scale with the ends sought, and secondly, the range of available alternatives, for the amount of destruction must be the minimum compatible with the achievement of the aim.

In the light of such desiderata it may now be asked if the strategic air offensive of the Second World War, which inevitably meant widespread death and destruction far beyond the lines, was morally permissible and, in particular, if this was so in view of the fact that much of the British effort consisted of area bombing in which the deliberate intention was the destruction of town centres.

Until 1944, strategic bombing was the only means by which offensive pressure of any significant kind could be exerted by Britain against Germany. Her armies had triumphed in the field to such an extent that no threat to her frontiers from the allied armies existed and, in addition, she was largely immunized from the effects of such blockade as could be imposed by the allied navies. If the strategic air offensive had not been initiated and sustained, the strategic prospects of Hitler's being defeated would have been gravely jeopardized. The apparent prospects of his defeat would have virtually disappeared for who could forecast how the Russians would absorb and then destroy the military might of Germany? It is difficult to see how Britain could have carried on the war from 1940 to 1944.

Nevertheless, and even allowing for this, the argument persists that strategic bombing, which it must be remembered killed not fewer than 200,000 Germans and perhaps as many as 600,000, need not necessarily have been area bombing, that area bombing was immoral and particularly so because it was strategically ineffective and was therefore

wholesale destruction without important strategic advantages. Strategic bombing until 1944, however, meant area bombing and even if area bombing did produce disappointing strategic results it was not undertaken on the assumption that this would be so. Britain did not, before the war, produce a force to undertake area bombing. On the contrary, the pre-war plans and initial war-time operations had highly selective and precise aims. Area bombing was adopted when, after much delay, it was recognized as inevitable. The primary object of it was to reduce war production and the will to war by the dislocation and destruction of towns. It was never a question of destruction for the sake of destruction. Though not all concerned at the time believed that area bombing was the theoretically best strategic means of achieving the aim and some knew, or thought they knew, that selective precision attack would be more effective, the fact remains that, until 1944, all with insight knew that area bombing was the only way of attempting the aim. After 1944, a different position was created and in the final phase of the war there was often a choice between area bombing and other kinds of attack. On many occasions, area bombing was still chosen. Strategically, this may have been a mistake but the assumption that it was also a moral error does not necessarily follow. Some, and notably Sir Arthur Harris himself, had a strong and sincere conviction that selective bombing was ineffective owing to the combined effects of German ingenuity and false intelligence. They believed that the Germans would always find a way round such damage as could be done to the known installations of particular industries and activities such as ball bearings or oil produc-

tion and transport. Moreover, their arguments were not without foundation. They believed that the only way of achieving effective results lay in the destruction of whole towns and that is why the area offensive was continued.

Apart from the fact that most bombing plans requiring precision attacks upon specific installations also required a measure of selective area attacks upon cities which, for example, contained benzol plants in uncertain positions, or important railway centres, there was then a continuing argument of strategic necessity for the continuation of general area bombing.

The moral justification of a general area bombing policy does not necessarily confer a moral sanction upon every individual step which was taken to implement it. Undoubtedly there were severe cases of over-bombing and the classic example is provided in Europe by the attack on Dresden in February 1945, which is now generally regarded from the moral point of view as the most controversial action in the strategic air offensive against Germany.

This is scarcely surprising, for Dresden suffered a more comprehensive catastrophe than any other town in Germany. The destruction in many parts of it was total and the numbers of people who perished were untold but certainly larger than in Hamburg.¹ Dresden was a fair Saxon city of architectural beauty and historic interest. It was

¹ The impossibility of calculating the number of dead is confirmed by Hans Rumpf who, during the war, was Inspector General of Fire Prevention in Germany. See his *The Bombing of Germany*, Muller (1963), p. 99. No reliance can be placed upon the specific figures which have appeared from time to time.

notable for its cultural amenities and, in February 1945, it was still almost untouched by the devastation of war which in every other place of comparable size and significance had reached nearly its climax. Why then, it has often been asked since, and at such a late stage of the war, should such a place have been so totally devastated?

There were, in fact, three powerful reasons which, in combination, produced the decision leading to the destruction of Dresden. It may be well to recall what these were. First, as 1944 drew to a close it became apparent that the earlier hopes of ending the war by the invasion of Germany in that year had foundered. The war would continue into 1945. It had already lasted more than five years and even when it did end, the Japanese were yet to be dealt with. German fighting discipline, as Lord Portal had predicted, was certainly holding until the end and new technological developments seemed to offer Hitler the prospect of a reprieve and the allies one of a renewed crisis. Germany, already armed with the V.2 which was the most advanced weapon seen in the European war, had established a clear lead in the evolution of high-speed manned flight without airscrews. Her submarines were beginning to appear with *Schnorkel* breathers and the possibility that she might produce an atomic weapon could not be excluded. Plans too seemed to be in hand for an underground guerrilla campaign in the event of the need arising. In such circumstances, anxious thought was given in London and Washington to the possibility of harnessing the great bomber forces to some dramatic and crushing stroke which might give the *coup de grâce* to Germany. Berlin, it seemed, might be the best target for such

a 'thunderclap' as the plan was named in code. But in view of what Germany had already sustained there was limited room for optimism about the outcome. Over Berlin, the bombers were likely to suffer heavy casualties. Some other targets might be preferable and Dresden became one of them.

Secondly, the advance of the Russian armies in January 1945 led the Prime Minister to think of ways in which the Western allies might give assistance. On 26th January, Sir Winston Churchill asked the Secretary of State for Air 'whether Berlin and no doubt other large cities in East Germany, should not now be considered especially attractive targets'.¹ The Air Staff quickly concluded that Dresden was an excellent target under this heading for it appeared that its destruction would hamper evacuation from the east and the transfer of troops from the west. Sir Arthur Harris was instructed accordingly.

The Commander-in-Chief had just suggested the same target himself, for Dresden was, after all, a city of 600,000 inhabitants which had long been on the list for the general area offensive. Thirdly, there was the motive of reaching out at last to a major target whose extreme range was no longer such a formidable obstacle as it had been when the German defences were more active and France was still in the German grip.

Such then were the basic reasons for which the attack was launched. They may to some extent upon the evidence now available be judged to have amounted to miscalculations. The Russians themselves, though enthusias-

¹ *The Strategic Air Offensive Against Germany*, vol. III, p. 103.

tic about the destruction of some of the other eastern towns, do not seem to have regarded Dresden as an especially valuable target from their point of view and it may be doubted whether its destruction was reflected in any particular military achievement on their part. The idea of a 'thunderclap' *coup de grace* may not have been wholly realistic and the fundamental effect which the destruction of Dresden had upon the capacity of Germany to continue the war cannot be measured. Even so and in combination with other events, it may have been not inconsiderable. The continuation of the general area offensive was also, as has previously been suggested, of doubtful strategic wisdom at this stage. But if each of the reasons had its respective defects, the three in combination amounted in the circumstances of the time to a powerful argument. At least, they are sufficient to dispose of the theory that the attack was wanton.

Nevertheless, the amount of destruction inflicted upon Dresden is still questionable. Though the Americans joined in the assault by day, the greatest part of the damage was done by Bomber Command in a double attack involving some eight hundred sorties on the night of 13th to 14th February. This too, in the afterlight, was perhaps a miscalculation, but in some of the accounts of the attack which have appeared it seems to be assumed that to forecast a miscalculation before the event is not more difficult than to detect it afterwards.

In fact, any bombing operation depended for success upon a variety of influences ranging from the exact weather conditions to the degree of enemy opposition. Few of them could be predicted with much certainty. An

underestimate of the obstacles was liable, in the best case, to lead to the failure of the attack and, in the worst, to a disaster for Bomber Command. An overestimate of them was liable to produce a case of over-bombing. As the war approached its end, the skills of Bomber Command reached their zenith and the power of resistance of the German defences approached their nadir, with the result that the danger of overestimating the obstacles became greater. In the actual event the weather and visibility proved to be better than expected and the German defences proved to be not merely ineffective but non-existent. The result was the over-bombing of Dresden. But, as was shown by the failure of some similar attacks upon similar targets in the same area at the same period, the error was by no means predictable.

The decision as to whether a moral judgment of the strategic air offensive against Germany needs to be modified by the particular attack on Dresden deserves to be influenced by these considerations of motive and of operation.

* * *

Moral arguments about the conduct of strategic bombing as also, no doubt, about other kinds of warfare and about war in general will always, and desirably so, continue. They will never, while men are permitted to believe in their own convictions, be brought into accord with each other. All that historians need seek to do is to reveal the evidence which deserves to influence whatever conclusions may be reached and, perhaps, to state their own. Strategic arguments, on the other hand, must ultimately, in theory

at least, be capable of being brought much nearer to accord.

When a new dimension is added to war by the development, for example, of submarine warfare or the conquest of the air and when new instruments of warfare appear such as the machine-gun, the heavy bomber or the tank they seem invariably to produce both within and without the armed forces the opposite and extreme responses which are represented in political terms by the labels of reactionary and progressive. In the literature of war, the reactionaries are commonly castigated. Haig, though perhaps with little justice, is blamed for his slowness in appreciating the importance of machine-guns and tanks and for his prolonged loyalty to the horse. The Admiralty is accused of having failed to appreciate the force of the German U-boat threat, and, though it was sailors and soldiers who harnessed the aeroplane to military purposes, they are often said to have turned a blind eye to it and some, indeed, did originally believe that it had no military value. Such criticisms, though frequently unfair in particular, obviously have substance in general, as nowadays is commonly appreciated.

Nevertheless, as is perhaps less commonly appreciated, the progressives too suffer from their defects. Their enthusiasm, whetted by the opposition of the reactionaries, has all too often resulted in a tactical evolution being confused with a strategic revolution. The advent of the heavy bomber is a case in point, perhaps the most important case in point. The fact that the heavy bomber operated in a new medium of activity and had the capacity to add a new dimension to warfare, coupled with the severity of

the opposition to its introduction, led its advocates to believe that it was the forerunner of a strategic revolution. It seemed to them that it was not subject to the classical principles of warfare.

The classical principles of warfare established that ulterior strategic aims such as the effective military occupation of enemy territory or the effective imposition of naval blockade must be preceded by the defeat of the opposing armed forces in battle. Thus, military achievement was seen to turn upon victory in the field and command of the sea upon successful fleet action. The idea of strategic bombing postulated the direct achievement of the ulterior strategic aim, the reduction of the sources of enemy armed strength, without any corresponding battle. If such a short cut to victory could have been achieved, then, indeed, it would have amounted to a strategic revolution, but, in the event, it could not.

Ultimately it was seen that the prosecution of an effective strategic air offensive depended upon the achievement of command of the air and that command of the air was a question basically of defeating the opposing air force in being. Thus, the major principle governing strategic bombing was classical and not revolutionary; it was the same as that governing the conduct of military and naval offensives.

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